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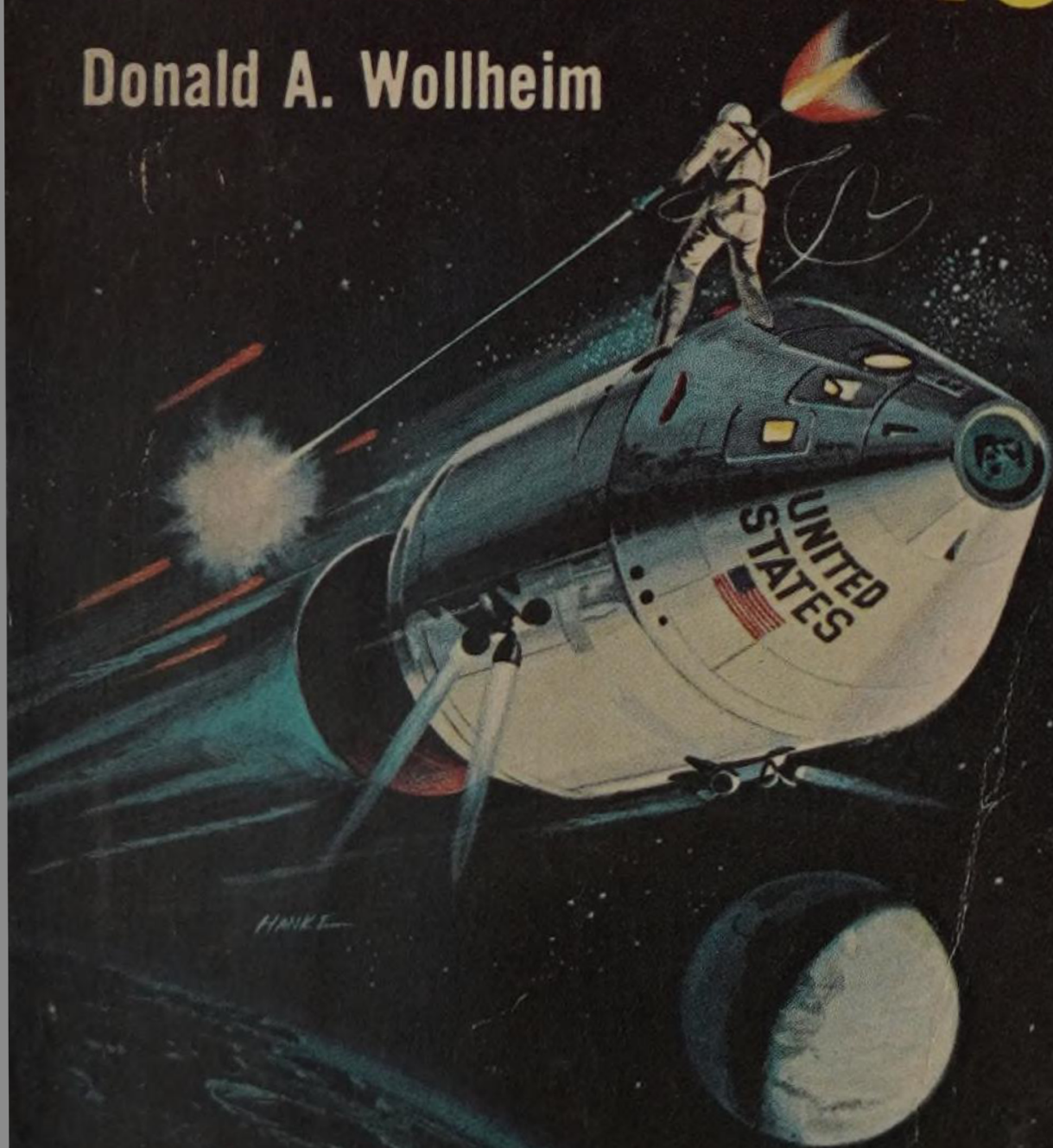
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Donald A. Wollheim



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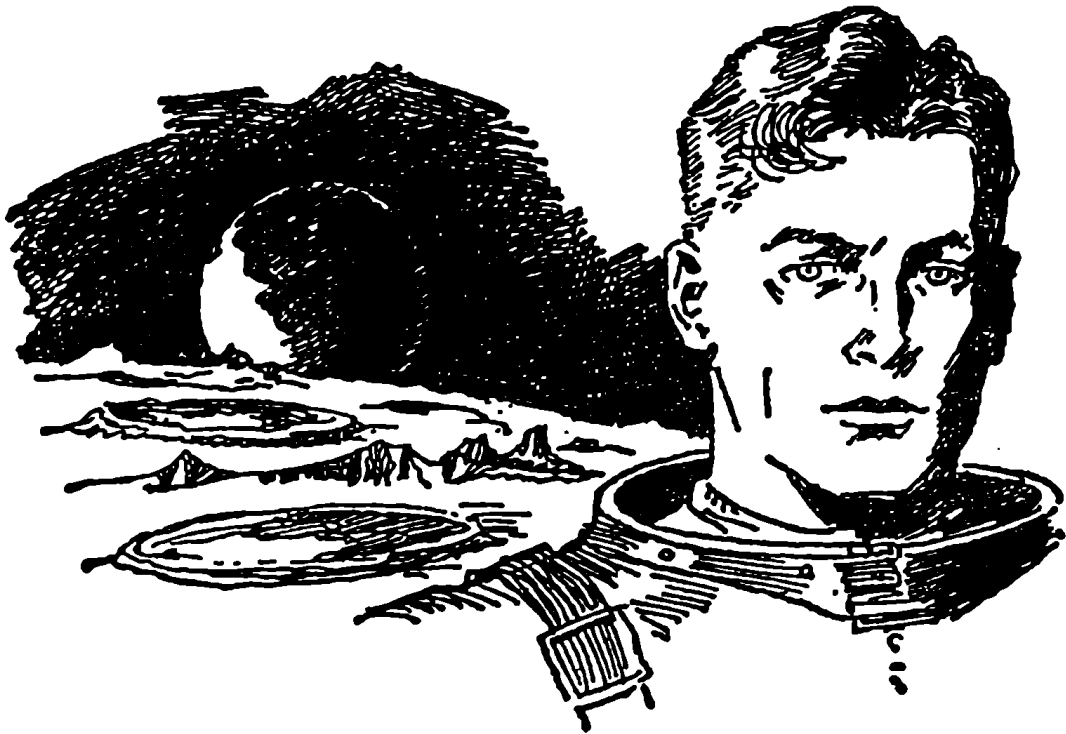
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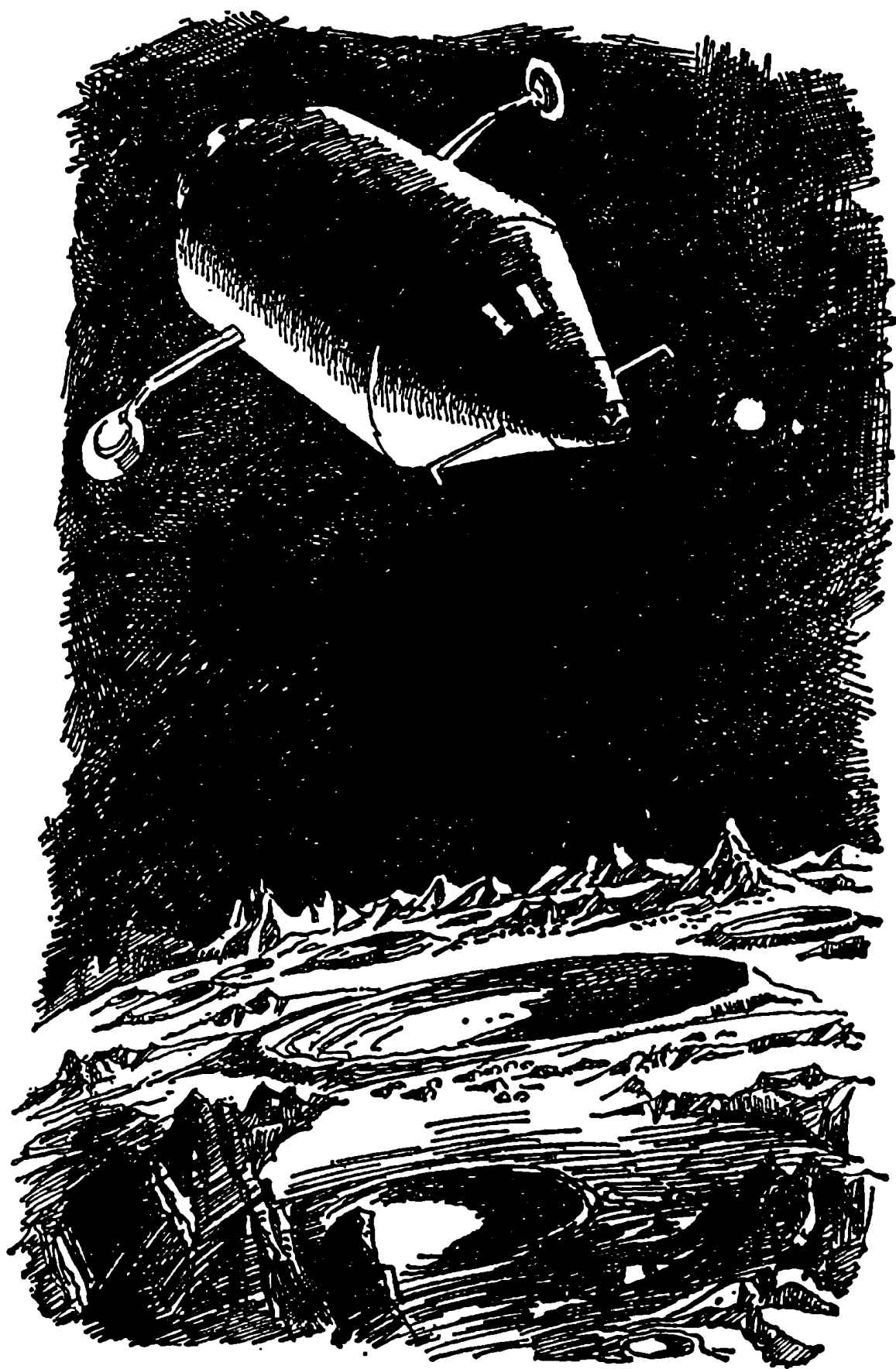
Donald A. Wollheim

Illustrated by Albert Orbaan



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CONTENTS

1. Something in the Air	7
2. A Giant Step	14
3. Tycho and Copernicus	20
4. The New Grounds	26
5. Advanced Saturns	33
6. The Moving Mountain	40
7. The Doom Car	46
8. So Many Wonders	54
9. The Secret at Goddard	61
10. Music from Beyond	67
11. In the Apollo	73
12. L Is for Luna	80
13. Real Deep Space	86
14. Emergency Awakening	93
15. Seeds of Destruction	100
16. Crater Joliot-Curie	107
17. Space Gunner	115
18. The Robot Station	121

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CHAPTER 1

SOMETHING IN THE AIR

"THERE's something in the air," Mike Mars said to Johnny Bluehawk as they stood on the wide porch of the main building at Skyhook. "I've been feeling it for the last day or so, and it's especially intense this morning."

"I know," said his dark-haired friend, the Cheyenne astronaut who had been Mike's sidekick for several astonishing exploits in space. "I know just what you mean. Everyone's been so quiet, and I sort of detect an odd, smug smile on Dr. Van Ness."

"I've been noticing that too. Last night at supper, when I asked him what was next on our program, he sort of smiled like that, when he said it wasn't ready yet." Mike rubbed a finger speculatively along his chin. His keen gray eyes squinted as he looked around.

It was morning in Central Florida and Skyhook was a quiet, hard-working place that morning. Hard-working for everyone but the two astronauts who had checked back at the secret headquarters two days before and still had not been given anything to do.

"Just take it easy and enjoy yourselves for a while," their director had told them. Merlin Van Ness, the famous aviation pioneer and civilian chief of the United States crash-program astronaut team, Space Task Group Q, had been the only one of the three directors present when the two had arrived. But even then there had been a sort of anticipatory grin on his face.

So they had loafed the first full day away, swimming in the lake on the private estate, playing tennis, or just wandering about saying hello to the technicians and engineers at work there. Skyhook was hidden away deep in the Central Florida countryside, not too far from Orlando, within a reasonable driving time of Cape Kennedy, yet not on any major highway.

Johnny and Mike were bronzed from the Western sun and in tiptop condition. Or rather Mike was bronzed, whereas Johnny was naturally a coppery tan, for he was a full-blooded son of the northern Cheyenne tribe, who had joined the Air Force and worked his way up until he stood by the side of his best friend Mike, both in captains' bars, both entitled to the spacefliers' badge—though neither young man ever wore it. For Space Task Group Q was a secret.

Still, this morning they were restless. They were used to hard work, study, concentration on the next space task that they would perform. This idleness was unusual.

"We could go swimming again," said Johnny. "It's early but warm."

"Well," said Mike, "maybe we will. But let's wait around a bit. Somehow something is going to pop up that will give us a hint of what's up. This kind of waiting makes me more nervous than any space shoot, I'll tell you."

They walked down the porch, stepped down the steps, and began to walk slowly toward the lake. "Let's keep in sight of the house and the main gate," Mike said. "I have the feeling they are waiting for someone."

So they wandered about and watched things. Skyhook had several low buildings besides the old-fashioned white-columned southern mansion which had been the Van Ness home until their black-

bearded chief had turned his place over to the Quick-silver Program. These buildings housed the testing equipment, the training equipment for the secret group of astronauts which was Uncle Sam's ace in the hole in the race for space.

It had been on these grounds that Mike and his six fellow volunteers for space had trained—that is, when they were not at work around the country, at Vandenberg and San Antonio and Alamogordo, the Mojave, and Cape Kennedy. But this was home base.

Of the seven who had started, one had been dropped from the program and there were six left. But today only Mike and Johnny were present.

Half an hour later, Mike and Johnny had just about decided to go back and get into their swim trunks and were walking back to the main building when a horn sounded at the main gate.

"Who's coming?" said Mike, turning to look. They strained their eyes to see who was in the big Air Force limousine that had just come up through the tree-bordered road to the barred gate. The guard was just letting the car through, and as it came in, two heads shoved through the open window of the back and there was a faint halloing.

"Hey," shouted Johnny, "it's Jack and Orin!"

The two gave yips of joy and ran down to meet the oncoming car. Inside the car the heads withdrew, and suddenly the car skidded to a halt. In an instant the door flew open and two redheads jumped out and ran to meet them.

In an instant the four met and were pounding each other on the back and exchanging jovial words. Mike stepped back after a moment and looked at the newcomers. "Gee, you look pretty good. Where you boys been? Up there?" He flicked his eyes up at the sky as he asked the last question.

Orin McMahan, the shorter of the two, shook his



"Who's coming?" said Mike.

head. "Nope. We've been out at the Ames Space Flight Center in California, studying."

Jack Lannigan, who was a strapping, lanky six-footer, added, "The Apollo capsule. We've been going over it mechanically."

"That's great," said Mike. "Johnny and I have been on the Gemini. We had a little job to do up there."

"Yes, we heard," said Orin, who was a Marine pilot, though a member of the Q astronaut team. "Didn't we, Jack?"

The fourth man laughed. "We sure did, though it was supposed to be top-secret. But Doc Van Ness made sure we knew. You did a good job on that mystery satellite, you two. Pretty scary, I'll bet." Jack Lannigan was a Navy aviator, and another Space Task Group Q man.

They started up to the main building, laughing and talking. "Yes," said Orin, the stocky Marine, "I guess you fellows are going to be kept on the Gemini program while we Apollo fellows go on to the moon. You don't mind, do you, Mike?"

Mike knew when he was being kidded, but for a moment a slight pang of unease went through him. He wanted the space objective, and there was enough truth to Orin's remark to make him worry. "Oh, go on," he said. "Somebody had to stake out a path in space for you to follow. So they called on the guys who know, Johnny and me."

"Anybody else around?" said Jack, breaking up the train of thought. "Where are Hart and Joe?"

Hart Williams and Joe Stacey were the fifth and sixth members of their group. "I believe they have been up in the Gemini too," said Johnny. "Van Ness wouldn't confirm it, but I am pretty sure from things I notice around here and around Vandenberg that they have been up in orbit and should be down any

time now. In the Caribbean area. That's where Colonel Drummond and Doc Holderlin are—at Cape Kennedy, awaiting word.”

“That's old news,” said Jack Lannigan. “We heard that out at Ames a week ago. I'll bet they must be down by now.”

Somewhere in the distance they heard a horn honking, then another. The four stopped, right at the foot of the porch steps, and turned as one.

Two more cars were approaching the main gate. Mike threw a glance at Johnny, caught his eyes, nodded. There was something in the air this morning all right. Something that had been waiting for them a long time, he thought, and he knew that his best friend had the same feeling.

The two cars cleared the security gate and came on. The four simply stood and watched. They were exuberant, but they knew that this was an unexpected occasion.

Their suspicions were confirmed. As the cars drew to a halt, two other healthy young men bounded out and dashed up to them.

Slender Joseph Stacey, Navy pilot, got there first and was pumping their hands by the time his companion strolled up.

“Hart,” said Mike, “you're as handsome as ever!” They laughed and banged each other on the back. Hart Williams, the third Air Force man in their group, was indeed good-looking with his glossy black hair, sharp deep blue eyes, and smiling face.

“It's good to see you all,” said Hart. “Even if we did get a little dunking before we got here.”

“How's that?” asked Johnny.

“We got the Gemini down all right, but we had to parachute out over the water as it came down. Winds made our capsule's Rogallo wing a little wild. So we hit the water and got good and wet before

the helicopters picked us out," explained Hart Williams.

"First time he ever got his hair wet with anything but stickum," chortled Joe. "You should have seen him, wet as a mackerel."

They all laughed as they climbed the porch. Suddenly Mike stopped, turned. He looked again. Yes, the second car had arrived and two more newcomers had stepped out.

"Dr. Holderlin," he said, naming the famous German master of space medicine who was the second member of the directorate of their secret project.

"And Colonel Drummond," added Johnny Bluehawk. The third chief had arrived with the other. The grizzled Air Force officer, their military director, was coming up to them now.

Mike turned to Johnny with an elated look on his face. "We're all here," he said excitedly. "The entire Space Task Group Q is here at the same time! There really is something in the air!"

"Or maybe beyond it!" said Johnny softly.

CHAPTER 2

A GIANT STEP

THERE was a sudden silence among the six young men clustered about the stairs to the main building. Dr. Holderlin and the colonel came up to them, and it was the German expert who greeted them. "What is the matter, boys? You are perhaps struck dumb at the sight of a doctor. You think maybe I stick you some more with hypodermics?"

There was a flurry of laughter. Mike stepped forward and shook Holderlin's hand. "Not at all. We've all been examined so often by space doctors, it would be like a real homecoming. I guess we are all wondering what brings everyone together at the same time."

"Ah ha," said Dr. Holderlin, assuming a mock quizzical look and turning to Colonel Drummond. "They are losing their nerve and starting to worry. They want action and danger. Just standing around is no good. What are we going to do with them, eh?"

The colonel laughed. "We can't have them all turning to shaking jelly from inaction, can we, doctor?" He turned to the group of astronauts.

"Get your stuff stowed away, you newcomers, and we will gather in the directors' office in forty-five minutes. So—scat!"

No sooner said than done. With whoops, the four new arrivals gathered up their bags, which had been deposited on the porch, and dashed up to the rooms which were theirs at Skyhook. Johnny and Mike

looked after them and soon found themselves alone again, though through the open windows of the old building they could hear youthful calls and voices.

"Something's up, for sure," said Johnny. "Looks like a rush task too."

"I can't say I mind," was Mike's reply. "When you think of how long we've been training, and of all the things we've had to do—it's time."

"And yet, Mike," said his Cheyenne friend, "it really hasn't been so long. We've packed an awful lot into our few years in the Air Force, an awful lot."

Indeed they had. Both of them had enlisted after high school, and both had met in training as pilots. They had won their lieutenants' wings as commissioned fighter-jet pilots in the Air Force and when the call came around for volunteers for the secret Quicksilver Program, both had signed up.

The testing had been hard but they had made it, and what followed was even harder—the days of study and experimental flight, days at Cape Kennedy, flights in Redstone and Atlas, orbiting the Earth for the first time, mastering the tricky rocket plane X-15, the Dyna-Soar program and the X-20, even a perilous space experiment at the South Pole—but it had all been in preparation for the conquest of space.

Mike had set his own sights on that conquest as a boy of twelve. It had been then that he had given himself his most solemn promise to devote everything to reaching the planet Mars. That red world had caught his imagination 'way back then, with its mysterious canals, its strange reddish coloring, its hint and promise of some sort of life. But the road to Mars was a long and hard one, as Mike had known even then.

Mars, of course, held a different sort of fascination for him by the coincidence of his initials. His full name was Michael Alfred Robert Samson, and his

initials had spelled out M.A.R.S. He had initialed his schoolbooks and his bicycle, and the other boys had taken to calling him Mike Mars as a result.

The name had stuck, and while officially he was now Captain Samson, U.S.A.F., everyone called him Mike Mars, and even the Russians had heard rumors of this name.

The Quicksilver Program originally paralleled the well-publicized and famous Mercury Program, but, unlike that, it was one of the best-kept secrets of the American space effort. Its astronauts were chosen for their youth, for their willingness to take risks greater than those asked of the experienced and more responsible talents of the public astronauts. The view was that they were expendable—which was a fancy way of saying that if they got killed in the course of their space work, nobody would know of it. Even their parents did not know what special work they were doing.

The original task of the Quicksilver Program had been completed when Mike Mars orbited the Earth. The group had been kept in existence, now as Space Task Group Q, and they were still taking risks with advanced space rocketry that the United States was not prepared to admit officially.

As Mike and Johnny talked, the two young men mentally reviewed this to themselves. What new dangerous task was being planned by their directors that required all six back at the same time?

Three quarters of an hour went by fast enough, and the two boys went back into the main building and found their way to the room that had been fitted out long ago as their planning and operations room, the directors' office.

They were the first of the Q team to arrive, but their three directors were already at their seats at the long conference table.

Merlin Van Ness looked up as they came in. His sharp blue eyes twinkled as he saw them, and for an instant his long right index finger stroked the black spade beard which was the chief characteristic of his features. He did not say anything, however, nor did Dr. Holderlin or even Colonel Drummond, with whom the boys had worked many times before.

The three were looking over a pile of papers as the boys came in. They divided the papers into six packets and slid them across the table to each of the places now being filled as the rest of the astronauts came in.

There was silence for a moment when the room was full. Then Van Ness laughed. "Relax. Take it easy," he said. "We have work to do, but don't act as if the place were mined."

There was a let-out of breaths and the tension seemed momentarily to fade. Colonel Drummond looked around, gazing at each of the astronauts in turn.

"We've reached the end of a lot of preliminaries," he said slowly. "We've done the work necessary to prepare man for the conquest of space. We've climbed the first rungs of the ladder. The time has come for the next giant step. That's what we're here to discuss."

The astronauts settled down now, applying the lessons in concentration they had all learned so well. Six pairs of youthful eyes looked back at the colonel's.

Drummond picked up a paper from the pile in front of him. "I have here," he said, "a report from Central Intelligence concerning the Soviet space program. This report, gathered at terrible risk by some agent in Siberia, informs us that the Soviets are about ready to make their try at the moon itself."

He paused. Around the room there was a dead silence, as each listener thought about that.

“We are now certain that within three months the Russians will launch a manned spaceship which will circle the moon and return. As you know from your studies, a circumlunar trip is a preliminary to a landing attempt. If the Russians succeed in circling the moon and returning, they will again prove their lead in the space race. It will be a terrific boost to their standing in the world.”

Dr. Van Ness spoke when the colonel stopped. “I think you all know that the United States has a moon program well under way. Our Apollo program has been charted out, and is projected to achieve the



“Are you game to try it?” Van Ness asked.

same thing—a flight around the moon, followed by a first landing.

“But our program is not scheduled to make the attempt for two more years.” He stopped, looked down at the stack of papers.

“All the components of the Apollo moonflight attempt exist now. But they have not been fully tested—refinements in the devices have not been made. The hazards are still extraordinarily high—even laboratory tests are incomplete. But the components do exist. They can be put together.

“Your government is asking you to attempt to beat the Russians now, at this time, with what we have on hand. We have volunteered Space Task Group Q to attempt to circle the moon ahead of the Russians. In nine weeks, to be precise. Are you game to try it?”

With one voice, all six yelled, “We are!”

CHAPTER 3

TYCHO AND COPERNICUS

DR. VAN Ness did not smile. Instead he looked carefully at each of the astronauts in turn. "I want you all to think about this for a moment. It's all right to be eager, but you must realize what a chance you are taking."

For a moment there was silence in the room, until Mike spoke up calmly. "I think you fail to realize that each and every one of us have thought of this moment all along. We've never stopped thinking of it. There's no hasty judgment in our response."

Van Ness nodded. "I suppose not. Still, I will remind you that we do not generally like to take chances on a rocket flight until we are at least ninety-nine per cent certain of our machinery. We have not had the time to assure that."

"What hasn't been tested in automatic machinery can be made up by the brain and hands of the man that flies the rocket, sir," said Mike again. "We have proved that, Colonel Glenn proved it, the Russians proved it. Courage and skill are worth a dozen robot controls."

"Correct," said Dr. Holderlin suddenly. "That's what I always said. Test the man, and the machine will do for later."

There was a sudden babble of talk as various astronauts offered their opinions in support of Mike's views. Merlin Van Ness tapped on the table sharply and brought silence again.



"The discussion is over. We will go ahead." He cleared his throat.

"The Apollo program is designed to end with the landing of an American on the moon and his safe return to the Earth. The purpose of that landing is to establish a base on the moon for our country, for scientific research, for national defense, and for the glory of humanity. It will mean the beginning of work for the establishment of a permanent lunar base—a station manned by Americans for further exploration in space and for the protection of our home on Earth.

"This program is the first true step beyond the Earth for mankind. It is the opening of a new world, even greater than the one opened by Columbus.

"The first active step in that operation is the circling of the moon without a landing. This is what we will attempt in nine weeks' time. We are going to beat the Russians to the job."

Colonel Drummond spoke up now. "And while our plans do not call for an attempted landing, the astronauts will send down an unmanned dummy landing craft, equipped with radio and telemetric devices to give us some needed information on the moon. If this device lands successfully, we may then be able to attempt a manned landing shortly afterward."

For a while thereafter there was some heated discussion around the table about these plans. Now everyone wanted to talk, and gradually excitement mounted in each of six young men's chests. Now it was coming real, now it was coming home to them. In nine weeks—less than three months—three of them would be visiting the moon in person!

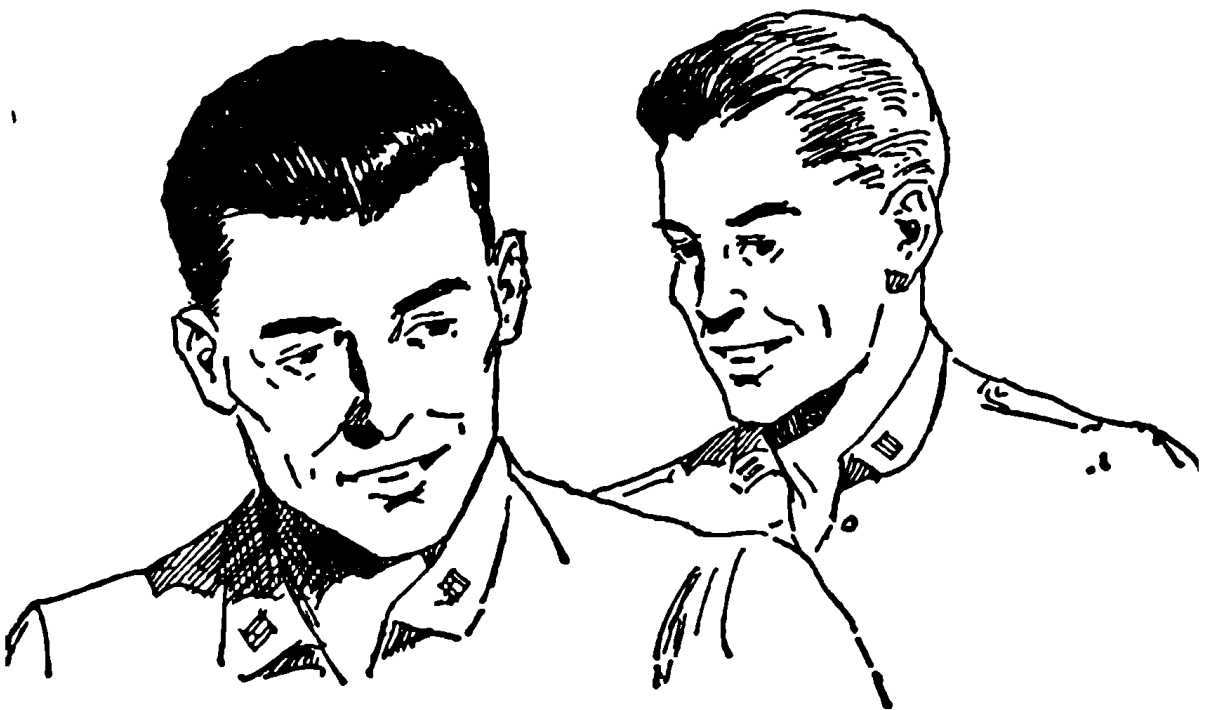
Dr. Van Ness glanced at the big clock on the wall. "It's just about time for lunch, gentlemen. We will adjourn in a few minutes for that. Then this after-

noon without delay we will begin our quick, condensed familiarization program.

"We have one more decision to make. The Apollo spacecraft will have a three-man crew. We are dividing you into two teams of three men each. Each team will study independently and learn to work as one unit. We have already established the two teams, and Dr. Holderlin will read out their arrangement. We have not selected which of the two teams is to make the first attempt. You will be in competition for this—we will decide that after observing your work."

There was a moment of suspense. The German space-medicine expert took a sheet and read it out. "For convenience, we have named the team after famous lunar craters. Team Copernicus will consist of Hart Williams, spacecraft commander and pilot; Joseph Stacey, navigator and copilot; Orin McMahan, systems manager.

"Team Tycho will consist of Mike Mars, spacecraft



Bluehawk and Lannigan.

commander and pilot, Johnny Bluehawk, navigator and copilot, and Jack Lannigan, systems manager.

"As soon as you are through lunch, you will be assigned work quarters and technical advisers and begin your studies at once."

With that, the meeting ended. And as Mike and Johnny walked out, in the silence of each man's thoughts, he knew that they were entering upon the most hectic moments of their career.

Lunch was silent and thoughtful; after lunch, work began just as earnestly. The three men of each team met with a different group of the familiar Skyhook astronautics technicians and began their studies.

As with similar operations, at first it was theory—study of the plans and outlines of the entire project, study of the capsule's diagrams and the Saturn rocket's construction. There existed many small mock-ups of these engines, but in three days they would exhaust these and proceed together to view and study the real things.

The work that McMahan and Lannigan had been doing even before their return had been on the capsule. It would be their task to play the parts of chief engineer, scientist, and internal mechanics—and to this end they had almost unknowingly been specializing during the whole course of the Q group's existence.

The work that the other four would do had also been prepared for. Everything they had done before, all the special things that had been given them, had been slanted to their final role.

Time moved swiftly from then on. The afternoon was put in studying the plans. Already the two groups could feel the tension between them. At dinner that night they stared at each other silently, spoke in whispers to their teammates as if afraid the other group would learn something.

So the first week passed, in rapidly growing competition. The tension might have become too great between the teams, for each man was anxious and hoping to be with the first to conquer space, the first to glimpse the far side of the moon, the first to get out and skim the surface of another world.

But before the tension could come to blows, the wise directors started each team on its travels.

CHAPTER 4

THE NEW GROUNDS

THE smell of salt air blew in over the sand dunes that ran along the outer edge of Cape Kennedy. Here and there masses of scrubby, tough desert brush grew, and along the water's edge long-legged birds stalked and hunted fish and tiny crabs. Mike Mars, riding in a staff car with Johnny and Jack, looked out across the land and the waters and took a deep breath.

"It's a nice day," he said casually. The others nodded, deep in their thoughts, for this was an unusual day for them. To the landward side they were passing the high gantries and concrete emplacements of the old Atlantic Missile Range grounds. Johnny and Jack looked at them—high, a bit away from the road, standing like a row of metal giants—and in their minds they bid each of them good-by.

A new side of Cape Kennedy was to open to them this day, and the old had become warm and comfortable and even easy. They understood the great rockets of the old Cape. They had flown in the Atlas and they knew the Thor and the Polaris and the Minuteman and the other missile-carrying monsters that had been tested and worked upon here.

Where they were headed was something new, the far northern section of the Cape, only a few years ago just a barren spit of sand and scrub, now the most guarded and most exciting land of all that wonderful area of space conquest.

Mike looked out not at the old gantries but at the

sea, and he thought to himself that it was indeed a nice day on the planet Earth. Earth, he said to himself, is the third planet of a star system. The star itself is called by men Sol. The system is the planetary family of Sol, the solar system. Earth is the third outward from the star Sol.

Earth is a nice world, he thought to himself, and he looked quickly back at his friends and again out to sea. It has wonderful great oceans and great areas of land—land varied and beautiful, filled with forests and farms and mountains and deserts, and the homes everywhere of men and women and children.

Why do we want to leave it? he asked himself. And why, he asked, do I personally want so much to leave it?

Johnny Bluehawk somehow sensed his thoughts, for this was a day that might open for them new concepts and close the old. "Thinking about our own world, Mike?" he asked softly. "Wonder why we'd want to leave it?"

"We're not deserting it, Johnny," said Mike slowly, composing his thoughts. "We're serving it. We're extending our world's glory and honor. We are reaching out a hand on behalf of our world to other worlds. We don't know if they are as good, we will never believe they can be as beautiful, but we want to share with the universe our conquest and triumph over this planet and through that over the cosmos.

"You know," he warmed to his subject, turned, to look at the Cheyenne and at lanky Jack Lannigan. "I don't feel that I'm flying away from Earth so much as that I am taking a bit of it with me. I feel that it would be grand to set foot on another planet and be able to say, see, I am an Earthman and we made it by our own efforts."

"It's a good thing to be an Earthman," was Jack's comment. "That's your idea. It sounds good. If only

we were all, here on Earth, united in the same way.”

“I don’t know,” said Mike. “We are divided now, but that’s only temporary—for a few years, for a few decades. But in the time to come, in centuries to come, we’ll all be rejoicing with each other together. Maybe it’s really a good thing that the world is divided into two competing groups. If it weren’t, we wouldn’t be so willing to spend the time and the money and the effort to conquer space in a hurry. So I like to think the Russians, at least the Russian cosmonauts, also feel the same way about the Earth and its wonders.”

“Sure, sure,” said Johnny, “but meanwhile they have some practical little stunts, like trying to shoot down our Gemini capsule. And who knows what they will pull this time!”

Mike smiled, pulled his eyes away from the sea. “I guess you’re right. Well, let’s get back to ground level and see what’s coming. I’ve always wanted to see this section of the Cape.”

They grew silent as they drew up to a new check post blocking the road. This was at what had once been the end of the development at the Cape. But now beyond the guardhouse they could see, stretching farther, miles of development—gleaming gray concrete and roadway as far as they could see. When they had satisfied the guards as to their security, the car drove on.

“This is all filled-in land,” said Jack Lannigan. “I’ve been reading up on this. It used to be a strip of narrow sand, and they have filled it in with so much rock and sand that now it’s a whole man-made peninsula of its own.”

“It’s simply incredible,” said Mike. “Look at it. Why it seems to be ever so much bigger than the old launching grounds.”

“Seems to be?” Johnny commented. “It is.”

The road ran on apparently endlessly, a wide road of new, clean concrete, and around them there stretched a clean new world of concrete and sand. The ocean stretched away on one side; the other was a man-made plain with, at the farthest edge, the waters of the Indian River. The gleaming span of the new causeway from the mainland could be seen now behind them, and behind them also the ranks of tall gantries of the old Atlas sites.

They were in a new and different world, a world that resembled the old grounds only as a giant resembles a dwarf. Here everything seemed twice the size, seemed on a larger scale and made to fit greater plans.

“Big things for big flights,” said Mike, almost to himself, echoing the thoughts of the other two. “The intercontinental missiles and the around-the-earth flights are now going to be just local jobs. This place was made for distant space, for the far-out flights.”

“For the Mars and Venus flights some day, Mike,” said the Cheyenne glancing at him. “This is the spot. Here’s the real spaceport.”

“Whoa, boys,” laughed Jack. “First stop, the moon. Local trip, in the vicinity of old Mother Earth. You talk as if you’ve been there and it’s just another trip.”

The others laughed. “Fact is, I’ve been there so much in thought that it does seem an old story,” said Mike. “But seeing this growing real around me makes it different somehow. The dream is suddenly real.”

They became quiet as the road swung inland from the sea and on their right the first of the great new Saturn sites appeared.

Another ocean of gleaming concrete between the road and the Atlantic now, and on it the rising ramp of a huge road that crossed their own driveway

somewhere ahead. Unlike the rest of the Cape, there was no elaborate framework of a gantry positioned on top of the launching pad that should have been at the end of that ramp. Instead, a slender metal tower, just the single holding line that would be left just at the moment of launching.

"The landscape is changed," said Mike. "The gantries are now obsolete on the big boys."

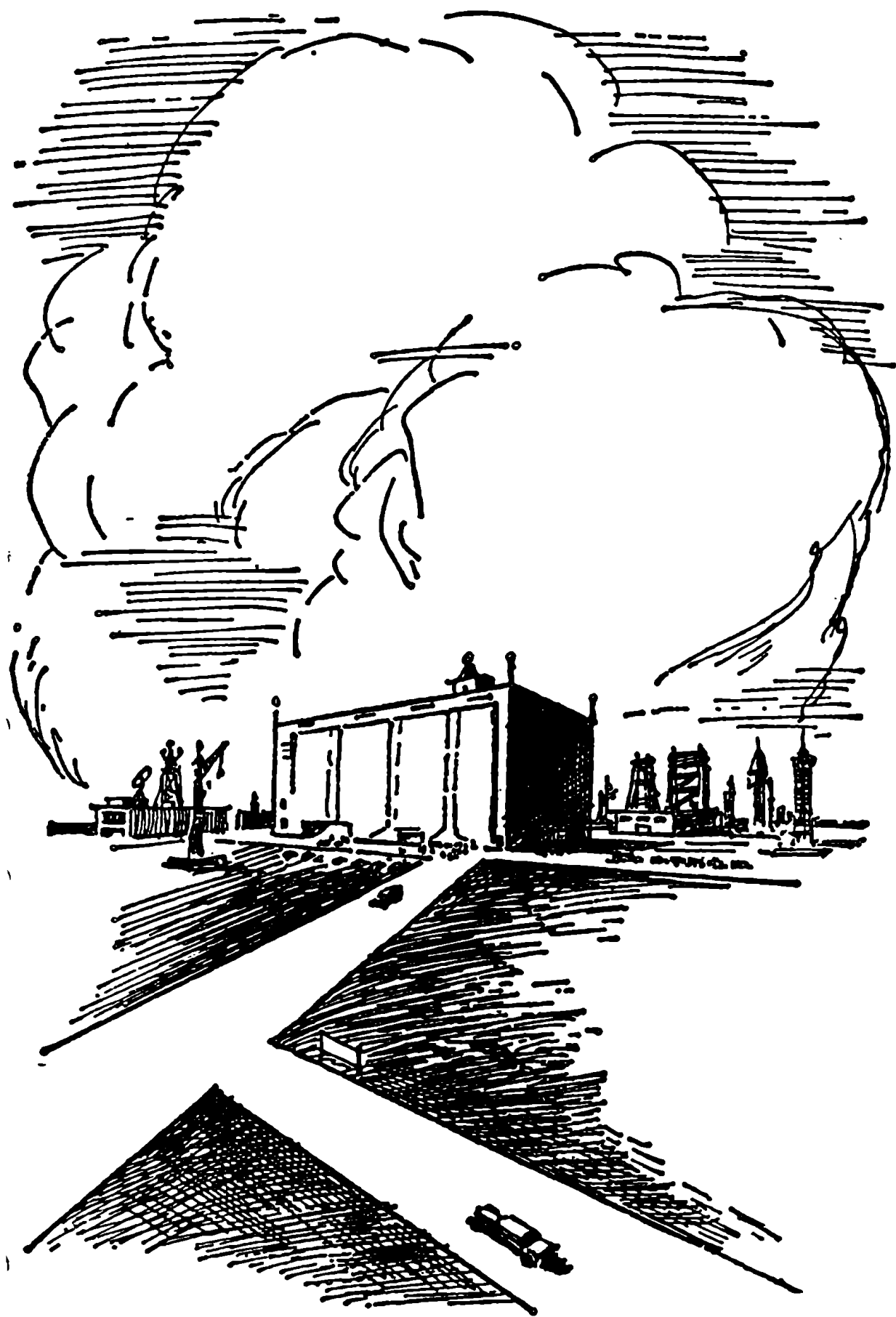
"And there's the building, the new system, the V.A.B.," was Lannigan's announcement, pointing left on the inner side of the road.

It was big, this strange new structure. A huge barn-like structure, from a distance like a windowless concrete-and-steel box, set at the conjunction of several wide ramplike roadways leading to the new pads. It stood alongside the newly enlarged water arm of the Indian River, a natural canal by means of which the spacegoing cargo would be delivered.

At first you could not tell how large this building was, for there was nothing against the flat landscape by which to judge it. But when their car turned toward it and came closer, the boys became silent.

As they drew up to it, reached the entry post and stopped once again for guard identification, they knew that building was a monster like no other on Earth.

There may have been bigger buildings, there were taller ones, but not when seen alone. And there was certainly no hangar like that elsewhere in the Western world. For a hangar it was. The V.A.B., which stood for Vertical Assembly Building, was the home and countdown pad for the planet-probing Saturns. It was a hangar and workshop big enough to hold six Statues of Liberty side by side under the same roof, and with doors big enough for her to walk out still holding her torch in the air if she wished.



But the statues it would hold would be six of the largest rockets America had made—six Saturns, each capable of lunar flight and positioned to be able to take off one right after the other, if the need arose.

CHAPTER 5

ADVANCED SATURNS

THE three boys stepped out of the car and stared up at the huge walls of the mighty hangar. They felt dwarfed, reduced to ants, by the size of the building. Though they had known what they would be coming to, the real thing itself silenced them, and they stood like any average American just gaping.

"Some skyscraper, eh?" said a familiar voice, and they lowered their eyes to see Van Ness's familiar features laughing at them. The director had come out a side door in the structure and was watching their faces with interest. "Wait till you get inside and look around."

"Whew," Mike let out his breath slowly. "It's something. Let's see what's next, fellows." He started toward the door, following Van Ness, and the other two came after him.

They passed through the side door and found themselves in a gigantic world of mighty, gleaming metal. The inside of the building, as large as a huge station such as New York's Grand Central Station, was lit but brilliant lights and by beams of powerfully directed searchlights focused on places where work was going on. It was webbed with movable girders and catwalks, and the seemingly tiny figures of men in white and yellow helmets were working on the three great missiles which now occupied half of the hangar's space.

They focused on the nearest of the Saturn rockets

and once again were astonished by its size. Compared to it, the Atlas was a toy midget, everything was on such a grand scale.

The three huge towers, each 210 feet high from base to nose, stood in turn on vast metal-reinforced platforms raised above the ground. Mike looked carefully at these and realized that they were such as could be straddled on the back of a truck—but a truck carrier larger than any he could dream of.

“The Advanced Saturn,” said Van Ness close to their ears, against the din of echoing sounds within the building, “is only a two-stage job, but it is sufficient at this time for the trip around the moon and back. The version that will do the landing attempt will have a third stage, but this one comes first.”

They walked around the first of the mighty space towers, then rode up on an elevator in one of the movable gantries inside the building, and while they inspected the space conqueror, Van Ness reviewed their lessons about the C-5 Advanced Saturn.

Its first stage, which stood 140 feet high by itself, consisted of a cluster of five gigantic F-1 engines, each greater in power than any single Atlas booster. Thirty-three feet in diameter, its tanks were planned for a fuel load of over 200 tons of liquid oxygen and kerosene, and its thrust capacity was over seven and a half million pounds.

Atop that, the second stage, seventy feet long and also thirty-three feet in diameter, utilized five J-2 engines with a thrust of a million pounds. This second stage was a liquid hydrogen-fueled job, the largest of its kind ever attempted.

Topping it all would be the payload, the Apollo three-stage capsule, no small job in itself. But the combined power of the two huge rockets was capable of lifting a 90,000-pound cargo, sending it to the moon and around the moon.

"When we plan an attempt to land on the moon itself, we'll use still a third stage," Van Ness concluded his comment an hour later, after the four had climbed around the rocket, watched the technicians at work, inspected the open sections which were being checked for wiring and tubes, and finally reached the top, where a dummy Apollo capsule was already in place.

The dummy resembled the real thing in size and weight, but instead of men, it would carry recording instruments to send back full reports on what happened during the test that was to come.

"There's still plenty of room up there," said Mike, looking up at the still high ceiling of the building. "This is no temporary structure."

"Definitely not," said Van Ness. "This is the place. Each of the Saturns here now is being readied. This one will go in forty-eight hours, and you and team Copernicus will watch this. Then the next Saturn in line will carry one of you two teams in the real Apollo, and the third will take the other, assuming you both qualify."

"Where's Orin's team now?" asked Johnny, looking down from the high scaffolding at the distant flooring of the V.A.B.

"Probably on their way home from Houston," said Van Ness, "where you will be heading for a few days after the shoot. A quick turn at familiarizing yourself once again with the Apollo, and then . . . we'll check off your ratings and set the date."

"And now to work again," said Lannigan, and he was right, because from that point on, the sight-seeing was over and the practice began.

While the astronauts were at work, there were many things going on at Cape Kennedy. There were things doing at almost all the pads, or complexes, as they are called. There was work going on on Atlas



*"It looks like another of those mysterious Mike Mars things,"
one of the Russians said.*

rockets set up for space probes, there were weather satellites being tested, there were various smaller solid-fuel missiles undergoing survey, a shoot was scheduled that afternoon for a new variation of a liquid-fuel short-range missile, and a countdown in progress for a firing the next morning of a new variation of the Thor-Agena, which might someday be used in some sort of orbital space operation.

At the Central Operations building of the old Cape, men were at work analyzing the results of previous tests, laying out schedules for new ones, working on drafts for repairs or alterations of old buildings and new complexes, plotting the future schedules for tests and flights, and keeping track of the many objects already in space. In short, a perfectly average day at the Atlantic Testing Grounds.



But there were also other activities not reported at Central Operations. There was the usual mass of tourists outside the range grounds, gaping at it across deserts and water from the highways that passed by. There were the wives of men working on the range on their way to meet their husbands at the gates at closing time, or else going about daily chores at the new housing developments and the many motels ringing the country's fastest-growing area. And there were two men talking quietly in a very private room in a housing development near Cocoa Beach.

Although both men spoke perfect English, spoke like native Americans without the trace of an accent, they were not speaking in English now, but in Russian, which was actually their native tongue. Years of training had taught them how to pass as Americans, and years of living unnoticed lives, under false names and false histories, had removed every

outward evidence of their real loyalties and purposes. They were just a part of the very expert and well concealed network of information gatherers that the Soviet Union had spread out to assist it in its world wide race against the United States for the conquest of space.

"Something urgent is going on at the Advanced Saturn operations," said one of these men. "There is a rush going on to put not just one but three into ready-to-go operative condition. My informant at the V.A.B. is quite positive that a big launching is close."

The other nodded. "This fits in with my own advice, which is that an Apollo capsule is being brought in on the service canal tomorrow—and that it is not just a dummy, but a fully operating three-man job."

Both men thought this over. Then the first said slowly, "You will recall we were advised that our cosmonauts were going to try a moon orbit in the next month. It would seem to me that the Americans are trying to beat us to this. It is just possible they can succeed. It will be very close."

"Perhaps," was the advice from his comrade, "we can do something to see that their operation is delayed. We ought to act on our own. We do have a couple operatives we can call in for such a delaying tactic."

"Not so easy, not so easy," said the other. "The security is too great and we could not hope to sabotage any part of the vehicle. But if we can find them, the crew that will ride this rocket could be more vulnerable. Especially if their identity is being kept secret from the American press—then they will not always be watched." He paused. "And since there has been no publicity, it looks like another of those mysterious Mike Mars's things."

"Sounds like it," said the other. "I think you should

, get in touch with our higher-up at once. We need a directive by tomorrow on this. Let us meet again tomorrow night and study possible plans of action.”

CHAPTER 6

THE MOVING MOUNTAIN

THE mountain moved. Or at least that was what your first impression would have been had you been Mike Mars. For the incredibly huge doors of the V.A.B. were open, and coming slowly through it was—a man-made mountain, a tower of metal many stories high, riding slowly but steadily along on a platform itself so gigantic as to stagger the imagination.

For the platform upon which the Advanced Saturn had been resting all the while was a moving platform, a huge flat surface on thick caterpillar-tractor treads, and powered now by an engine strong enough to lift and carry the 2500 tons of weight standing upon it.

This most gigantic tractor in the world had been built especially for this task and it was moving now, carrying the space conqueror to its launching pad.

“Six hours and still counting,” came Johnny’s voice in Mike’s ear, simply quoting the latest word from the check-out. “Six hours to go and it isn’t even on the pad yet.”

“But it will be,” said Mike, continuing to watch. They were outside the building now, and it was the day after their arrival. They stood, the three of them, with Van Ness, watching the Saturn going out for its shot that day. Opposite them, across the wide six-ply runway, was another group, three young men and an older man—the Copernicus team and Colonel Drummond.

Steadily the mighty vision proceeded on its way

and again Mike felt as if he were a pygmy watching elephants moving. For this was a moment to be remembered, a sight to be treasured.

Riding, far on top, like a penthouse atop a skyscraper, was the seemingly little cap that was the Apollo. Little? It was itself five stories high, a regular house, and yet the missile it rode dwarfed it.

Steadily the two Q teams watched it, followed its progress down the road, watched it stop an hour later at the volatile-fuels storehouse, where another great gantry slid up to it and workmen in coveralls and masks began the task of loading its huge tanks with the frozen volatile gases that would propel it on its way into outer space.

Working with great energy and practiced motions, the workmen pumped the fuel up, and clouds of steam and vapor billowed around the base of the mighty Saturn as the inevitable overflow and escape fumed into the warm air of the Cape.

The boys snatched a quick lunch from a small sandwich truck that had come to them while they were watching, and when the fueling was over, they were able once again to follow the progress of the Saturn as it moved slowly, majestically, up the long ramp to the platform by the sea, where at last it rested.

The huge carrier slid out from under the platform base and began its withdrawal to the V.A.B. A mile away the deep-sunk, heavily fortified blockhouse rested, a full mile away from the launching pad, and there the two teams of boys gathered, while the last hour ticked away for the Saturn's test.

It stood out there alone, on a man-made prairie of concrete, high up atop the platform, with a thin steel tower holding it, and nothing in the landscape around so big and wonderful. Far out to sea a couple of tiny wisps of smoke indicated the outlying ring of Navy vessels waiting to check the flight out. The red signal

was on all over the Cape, and now horns blared a warning for traffic to stop.

The air was empty of planes, for all planes that might pass in the vicinity of the rocket had been grounded. And though no special press program had been planned, there was the inevitable gathering crowd of sight-seers miles away across the sand, and quite a few reporters wondering what was going on and hoping to get a good story.

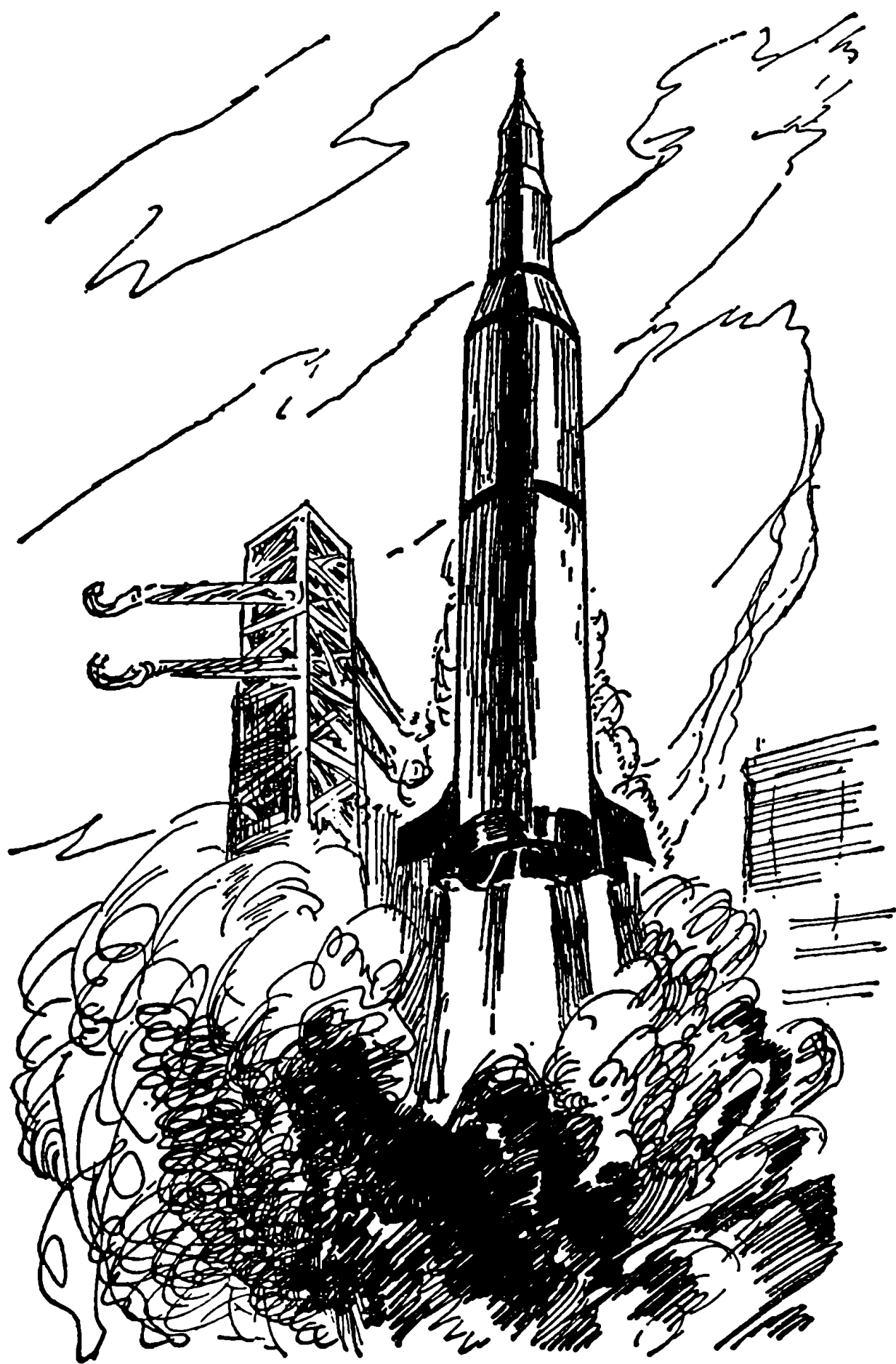
In the blockhouse the minutes were being sweated away. Fifteen, ten, eight six, five, four. Mike and the others stood directly behind key men as they watched the colored lights and read the meters on their various boards.

Coldly, unemotionally, the skilled voice of the counter droned on. "Two minutes and counting . . ." Umbilical away. Fuel on. Bit by bit, everything in order, everything perfect.

"Three, two, one, go . . ." and there was a moment's silence as somewhere a switch was pressed and the tension mounted. On the television screens the huge mountain of metal stood there. Then there was a flash of fire and a sudden billowing of smoke, and slowly, slowly, the mountain began to rise into the air. There was a moment in the blockhouse when not a breath stirred; the Saturn rose steadily and began to move higher and higher.

Then, as it rose, they could see the metal tower that had held it to the last simply melt away. They could see the smoke rising from the concrete pad where the terrible flames of five of the greatest rocket engines man had ever made were tearing the whole structure to pieces, literally eating it up with the fury of their blasts.

The blockhouse itself began to tremble as the terrific vibrations reached them through the concrete and sand and stone, and through the air.



But the control room stood, and suddenly the television went black as the blast hit even that well-protected viewer, and in a few seconds of blindness a new sending station cut in, one from far away, so that suddenly the vision of the pad became small and distant.

The Saturn was high and rising and moving faster and faster, and below it the ramp and the pad were cracked and blackened and splitting as the very sand was fused by the intense powers playing on them.

Then, calmly, the voice of the counter again, as if nothing at all had happened, "Plus eight seconds. Plus nine, plus ten."

Up and up, and everyone still stood at his panel, breathless and watching.

The crowds that had come to watch from a distance were still cheering when the sounds from the Saturn hit them, and they were hushed by the man-made uproar, and the terrible booming thunder blasted about their ears as no storm had ever blasted.

Some held their ears, and some cowered to the ground, and some cried out unheard against the immense ocean of noise that seemed now to engulf them from the far-off spot where the smoke and the shining rocket had arisen.

In the blockhouse, mostly shielded from the racket outside, men were making a racket of their own inside. They were yelling and cheering, and shouting as the monster on which they had worked and on whose prowess the United States was banking cleaved the blue sky and tore on upward and outward, bent for the darkness and stillness of outer space, carrying the first challenge to all the universe that man was on his way out at last, that in a few more rotations of the earth a twin to this would be going out there carrying the most precious cargo this planet had to offer—three young lives prepared to prove man's mastery over the

ocean of space that stretches from one end of the universe to the other and in which our whole world is but one floating island.

That was Mike's thought as he watched the silvery splinter of the Saturn vanishing even in the long-range lenses of the television eye. He looked at Johnny, and in the Cheyenne's gleaming black eyes he saw the same vision, and again he looked to Jack Lannigan and saw in his blue eyes the same gleam, and he looked to Orin, and Joe, and Hart, and saw it there too, even as it was present in the keen eyes of Dr. Van Ness and the narrowed airman's eyes of Colonel Drummond.

"This is it," said Mike slowly, almost to himself, glancing around at Johnny and Jack.

"This is it," said Hart Williams, at the same moment, looking at his teammates.

Then the two leaders looked at each other. They nodded in unison. It was a competition they would fight to the utmost to win, but it was a team also, and whoever won would have the other side fighting shoulder to shoulder with him at the last countdown.

CHAPTER 7

THE DOOM CAR

THE spirit of competition was rising in the two groups of astronauts. After the launching, after the couple of hours spent in the new Advanced Project headquarters building getting the readings and evaluations of the shoot, the six young men and their directors were ready to quit for the day.

"You fellows better not rest tonight," called Hart to the three members of the opposing team. "We're so far ahead of you we three are going into town and have some fun. But you three, you'd better stick with your books tonight."

"Look who's talking," called Mike. "You Copernicus characters are just whisting to keep up your courage."

The six began hoorawing each other, and after a little while Colonel Drummond stood up and rapped on a chair back. "All right, enough of that. Whatever you're going to do, better get started. Work's finished here for tonight. Tomorrow both teams assemble at Skyhook, and we'll get back on training schedules."

Hart Williams, Joe, and Orin whispered together a moment and then took their leave. Mike gazed after them, then scratched his head. "I wonder what they're really up to," he commented to Johnny.

"My guess is they really mean it," the Cheyenne said in reply.

"Bet they're going to take in a movie," said Jack. "But they sure are cocky. Do you suppose they have a lead on us? They've been through the works at Hous-

ton and we haven't yet. Maybe they know something."

"Oh, pshaw," said Mike. "I think we're being kidded. Come on, let's follow them, see what happens."

The three got up and left, going down the corridors of the big new control building and into the main lobby. They caught a glimpse of their three rivals just leaving the main door. Quickly Mike and his friends went to the door, looked through it to see where the others would go.

They watched the three figures of their friends go down the walk to the road. Two blue Air Force cars were parked there, and when the drivers saw the three young officers approaching both got into the cars and started their engines.

Hart cocked his head quizzically as he and his two companions came up. He knew he had called for transportation, but that had been only a few seconds before, and the car he'd asked for surely hadn't had time to arrive. What were these two cars waiting? If he could get to use one of them, it would save time and be a bit of a joke on whoever had asked for them. Besides there'd be a car along.

They started toward the smaller of the two cars, but the larger one, parked several yards away from it, suddenly moved forward into their path and the driver leaned out and called, "Captain Samson? This is the car you ordered, sir."

Trained to split-second decisions, the three Copernicus astronauts glanced at each other and kept their faces straight. Each thought exactly the same thing. Here's a chance to find out what Mike and his men were going to do really. And maybe a chance to have some fun at Mike's expense. After the day's experiences, they were all in an elated mood.

"That's right," snapped back Hart with hardly any noticeable hesitation. He opened the back door and

his two friends eased themselves in, keeping their faces straight. Hart leaped in after them, slammed the door, and said, "You know where to take us, I presume."

"Yes, sir," said the driver, now back behind the wheel, and the car pulled away, rolled around the other official car, and sped off. The driver of the other car looked after them in puzzlement, got out, and was standing scratching his head when Mike, Johnny, and Jack came up to him.

"This the car for Captain Samson?" asked Mike of the driver.

The airman turned around, came to attention. "Yes, sir. This is the car you ordered. But, sir, you didn't order two cars, did you?"

"Huh?" said Mike. "What do you mean?"

"Well, sir," said the driver, opening the back door of his compact sedan. "I heard that other driver say he was waiting for a Captain Samson too, and those other officers got into it."

Mike flashed a startled look at his two friends. They stared back. "Two cars?" murmured Jack Lannigan. "Something strange here."

"Do you suppose the colonel ordered one for us and had something special in mind he forgot to tell us about?" was Johnny's spoken thought.

"Never mind," said Mike. "Let's not let them get out of sight. Come on, get in and we'll try to catch up with that car."

The three piled into the rear while the driver jumped into his seat and slammed the door. He took off with a rush, skidded around with a screech of tires, and started off down the road in the only direction the other car could have taken.

The first car was out of sight, but as the road from the building along the newly developed fringe of land was the only one, they were safe in assuming its direc-

tion. They sped as fast as they dared, but the regulations called for a uniform slow speed; they did not want to violate them and thereby risk an accident in this surrounding of danger.

Ahead of them, in the first and larger car, the three members of the rival Copernicus team were laughing to themselves. They had put one over, all right, and they'd see the joke through.

"Do you suppose," whispered Joe Stacey to Hart Williams, "they had something good arranged for them? A party or something that they didn't invite us to?"

"Or maybe they're going to get a special inside look at something we won't see for another couple of weeks," chuckled Orin. "We'll get the jump on them, if that's so. And if it isn't, we'll still have made chumps out of them."

The three leaned back in their seats and watched the road and scenery. They were soon out of the guarded area, their driver stopping to flash his identification card, although they did not themselves see or hear what he had to say. The car sped along the causeway across the waters and towards the mainland. Along the Merritt Island Stretch, the car drew to a stop when a big burly man in airman's blues thumbed the car. This newcomer seemed to be a friend of their driver, and when he hopped in next to the driver, the fellows in the rear took it for granted that he was just a pal hitching a ride.

Even though an airman may be assigned to chauffeuring officers, the camaraderie of the Air Force never objects to helping others out on the way. Hart and his friends were used to this.

The two in the front seat exchanged a couple of whispers, and once the newcomer, a heavy-set man who seemed a little older than the usual youthful Air

Force boy, threw a sharp glance back at their passengers.

The three watched the road. Where were they going? Was it to a theater in Cocoa City itself? The car sped through the town and out again. No, that wasn't it. Well then, where?

They were intrigued and beginning to wonder themselves. It was going to be a bit of fun finding out what secret was waiting for Mike and being kept from them.

The car sped on along the Central Florida highway. Far behind them, other cars moved along about their business. No one in the car noticed that among the cars following them at a distance was another blue service car, a smaller, compact type.

Mike was leaning forward, resting his arms on the back of the driver's seat and watching the distant car ahead. "Keep 'em on track. They may turn off. We don't want to lose them," he cautioned the driver.

"I get you, sir," said the airman, a slight smile on his own lips. This was a variation of his usual routine and it promised to be a bit of fun.

"And there they go," said Mike as he saw the distant car turn sharply in a wide, skidding turn and head off into a narrow rural road cutting through the tropical wooded region they were passing.

When they reached the road, they swung neatly about and headed on down the same road. It was a narrow one, with the heavy tropical trees about them, clusters of clinging Spanish moss, and entwined damp foliage. The road wound on in the semidarkness of the thick growth typical of some parts of tropical Florida, typical of the type of road that would have taken them to Skyhook itself had they been farther inland.

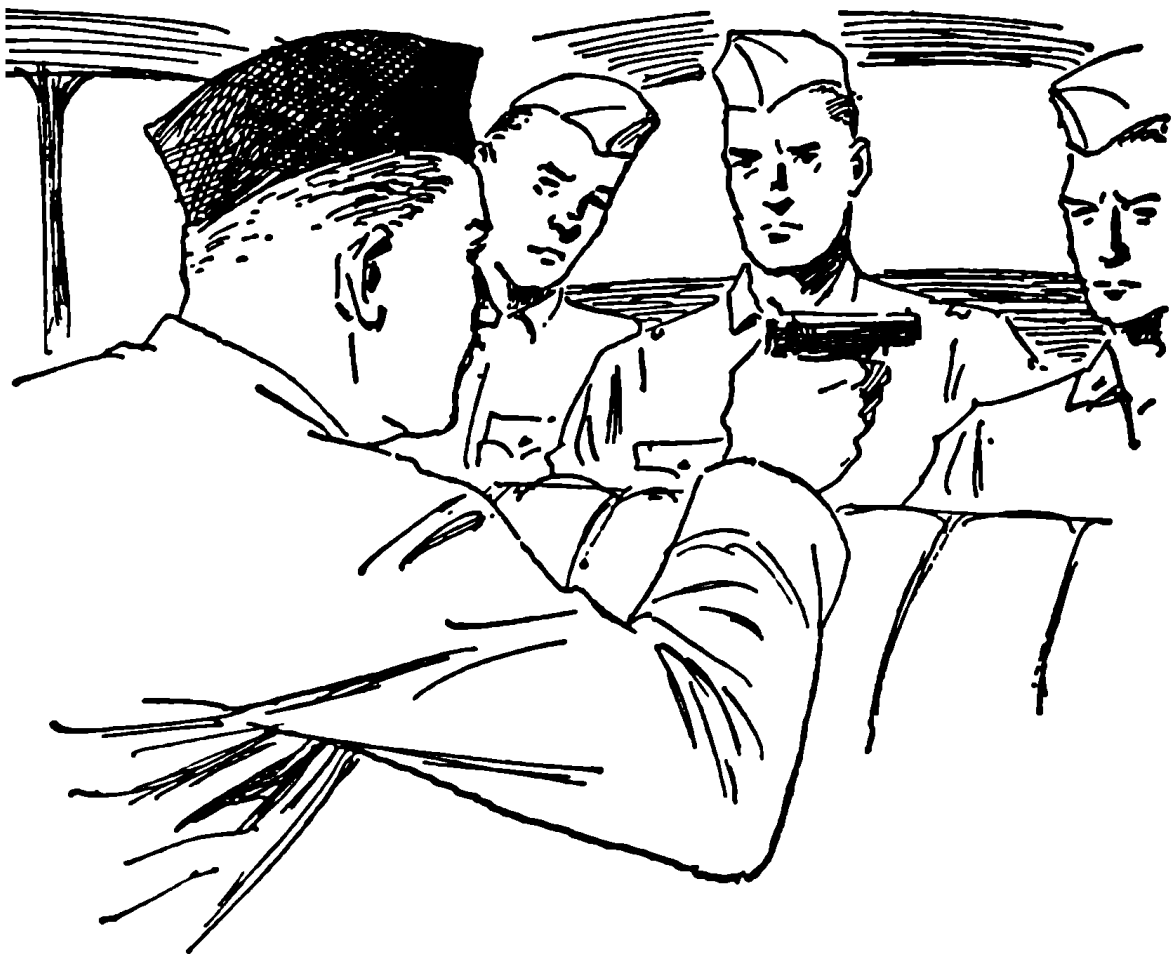
"Don't lose that car," said Mike. "It might turn off somewhere or make a stop."

The driver said nothing, concentrated on his driving.

Ahead, the first car rushed on, too fast for safe driving. Hart Williams became a bit uneasy. He leaned forward. "I hope you know this road," he said to the driver.

He got no answer, the man at the wheel giving a grunt. Then, as Hart leaned forward, he caught sight of the hand of the driver's companion. There was a glint of something metallic and blue half hidden by his big fist.

Hart pulled back, suddenly uneasy. He leaned over to Joe, sitting next to him, and whispered, "I think that fellow's holding a pistol in his hand. Something's sockeyed here."



Keep your hands off the door," said the man behind the gun.

Joe nudged Orin and repeated the word. The three of them, alerted, began to take stock of their situation. The car was speeding through strange woods. They felt in their clothes, but none was armed. Then Orin reached a hand for the door and clicked the lock open preparatory to arranging a chance to jump.

There was a mutter from up in front and Orin raised his eyes to look into the mouth of a pistol. "Keep your hands off the door," said the man behind the gun. "Just sit back."

Orin pulled back into his seat and the other two did likewise. The man with the gun looked at them from across the seat. He stared at them silently, and they stared back.

The car sped on; it came to a clearing in the forest and they could see ahead of them that the road came to an end at the edge of a deep ravine. The man with the gun reached out and opened the forward door on his side. The car slackened speed, and the three astronauts could hear the click as the drive loosened the door on his side.

Behind, Mike and his friends followed the darkish road, moving as fast as they could. They drove on now beginning to wonder themselves where the strange chase was leading to. They came out to a cleared space, and there they saw the car ahead of them slowing down as it neared the edge of the deep ravine.

"Hurry!" shouted Mike, instantly aware that they had run into a plot of some kind. "Get up to that car—fast!"

The driver stepped on the gas, while Mike swung himself over into the seat next to him.



The road came to an end at the edge of a deep ravine.

CHAPTER 8

SO MANY WONDERS

THE driver of the first car had already unlatched the door on his side, preparing to jump as soon as he had headed the car to roar to the edge of the ravine. His companion with the pistol had already done the same with his door when, lifting his eyes for a second from the three in the back seat, he cast a glance through the rear window.

"Look out!" he shouted. "We're being followed!"

Hastily the driver threw a glance over his shoulder while Mike's car was already swinging up toward them fast with the three astronauts leaning forward ready for action. He threw a curse, tried to force the door open and gun the engine at the same time.

With the two kidnapers so suddenly flustered, Harry Williams saw his chance. Ignoring the pistol, which was not at that moment pointing directly at him, he leaped forward, throwing himself across the back of the driver's seat, and grabbed the wheel.

There was a moment of skidding and twisting as the two pulled the wheel in opposite directions. The man with the pistol turned and tried to help his friend, and the other two astronauts seized the opportunity to go into action.

There was a wild frenzy of activity inside the car—fists flying, shouting, bodies trying to crowd each other—with the car now wobbling wildly from side to side while still veering first near and then away from the ravine.

Mike, now seated next to his own driver, gripped the side of the door, ready to get into action. "Swing it over," he ordered. "Can you get up next to them?"

"Trying," gasped the driver, speeding up, then pulling away as the other car swung erratically back and forth. "Now!" shouted Mike, and the car turned and hit the forward car a sharp slam in the side.

They were facing away from the ravine just then, and as the larger car started to roll over, the driver's door swung open and the saboteur tried to jump. He fell onto the ground just as the car turned over on its side, wheels spinning.

Mike jumped at that moment, and, as the cars had both come to a sudden stop, hit the ground on his feet and ran for the fleeing man. He tackled him low, brought him down, and in a moment was seated on top of him, pinning him to the ground long enough for his comrades to reach him and help him.

Back in the overturned car, Orin and Joe had the driver's comrade held tight, having wrenched his gun from him before he had ever had a chance to shoot. They managed to worm out of the overturned car, now lying on its side, dragging the culprit with them.

Hart Williams climbed out awkwardly after them, groaning and holding his arm. He sat down on the ground, looking pale, while the others secured the two kidnapers.

Mike got to his feet, looked around. They had had a narrow escape. He could follow the skidding tracks of the first car with his eye, and had it not been for the timely arrival of his own car, there was no doubt that it would have gone over the edge, with its victims till inside.

He walked over to Hart. "Are you all right?" he asked, squatting down.

Hart shook his head. "I don't think it's broken,"



Mike ran for the fleeing man.

he said, still rubbing his arm, "but it sure hurts plenty. I caught my hand in the steering wheel when we turned over, and it feels as if I wrenched it badly."

Mike worked off Hart's sleeve and saw that the other's arm was already discoloring. Hart was beginning to catch his breath a bit, and with Mike's aid he got to his feet.

Johnny Bluehawk meanwhile had been hunting through the grass, and now found the pistol that the fleeing man had dropped. He held it on the two captives, now sitting on the grass sullenly, while the others grouped around them.

"Mike," he said. "Better get someone to take Hart back to have that arm looked at, and then come back with the service police. We'll wait here and hold these two."

Mike nodded and helped Hart into their smaller car, whose front grille had been bent by the collision but which was otherwise in good shape. Orin, who had banged his shoulder during the accident, went back with them.

By the next half hour all was over; the two men were in custody and on their way to lockup and investigation, and another car was taking the astronauts on their way to Skyhook.

That evening there was a council of war at the big guarded estate hidden in the Florida woodlands. At the big house the astronauts gathered, all six of them, and the three directors with them.

Van Ness was troubled, Drummond still angry, and Dr. Holderlin seemed his usual self, somewhat quizzical in his way, a little smile of impatience coupled with a keenly critical eye.

It was the German space doctor who opened the discussion. "I must say that I cannot allow Hart

Williams to proceed with his training for at least ten days. His arm is not broken, and that is a near escape for him, but he is not going to be able to use it for several days, after which he will have to go easy for several more. I am ordering Hart out of active duty until then."

He looked around. "Und you, Orin, you got nothing but a black-and-blue shoulder, which should go away in a couple of days, but meanwhile I am going to make you just to sit on the porch in the sun and take it easy."

The rest of the astronauts squirmed a bit, as he looked them over. "You are lucky, the rest of you. You got off without a scratch, but you could easily have been hurt too. So you all I give a clean bill of health."

Colonel Drummond stared at Mike, who looked back at him with his clear gray eyes and suspected what was coming. "This means," the colonel said, "that team Copernicus is out of the race for this first Apollo flight. We might put back the whole program long enough for both teams to get back on an even footing, and I talked about that with NASA and the Pentagon. NASA was willing, but the Pentagon pointed out something we have to consider now—the sabotage attempt."

"It means the Russians are onto us. At least they know something is up and they are trying to delay us. We don't want to have them gain their point, even though they had to spend two of their agents to get it. So we are not only not going to delay our program, but we are even going to try to speed it up. We are advancing the date of the flight as much as we dare—three days earlier right now—and we are going to schedule team Tycho for it. Can they do it, Doctor?"

Dr. Van Ness, on whom the colonel's eyes had turned, nodded slowly and fingered his little black beard. "There isn't the time there should be, but in an emergency, we have to take extra risks. That's what this whole Q Task is for, as we all know. Actually the boys know all they need to know. What they needed was more practice with the mock-up models. We'll squeeze in as much of that as we can, down in Houston tomorrow and for the next ten days."

He paused. "Bluehawk and Lannigan will fly west tomorrow and report in at the Manned Space-flight Center. Mike will join them later. As the commander of this flight, he has some highly classified business to take care of with me first."

Van Ness turned to Mike. "You and I will fly up to Goddard tomorrow for a very special briefing. Then you'll join the rest of your team the day after."

The meeting broke up in a buzz of conversation. Mike and Johnny went off to their room, to bed in. As they turned out the light and got ready to sleep, Johnny remarked, "What do you suppose is up, Mike? What do they know that they're not telling everyone?"

Mike looked up at the ceiling in the darkness and then turned his head so he could look out at the stars through the open window. There were so many of them and they shone so brightly . . .

What secrets did they hold? What marvels were waiting up there for man to uncover?

This was the thing that had haunted him all his life. Was he about to learn something of that in the next twenty-four hours? And what would he find out in space itself, out in deep space?

"I don't know, Johnny," he said dreamily. "But if it has to do with the mysteries of the universe, I want to know it, good or bad."

“So many stars,” murmured Johnny sleepily. “So many mysteries.”

“So many wonders,” replied Mike, and then there was silence.

CHAPTER 9

THE SECRET AT GODDARD

Just fifteen miles from the heart of busy Washington, in the town called Greenbelt, lies the mind and registry of several dozen other planetary bodies. The business of Goddard Space-flight Center is not located on Earth. It is located in orbits out in space, circling the mother planet, the orbits of moonlets never planned by nature, but planned by the mind and work of man.

Goddard keeps track of satellites. It charts their orbits, keeps the records of their messages, listens to their calls and complaints. Let a satellite get into trouble out there in the dark, empty void, Goddard hears it and heeds its call. Always it is the business of the sprawling expanse of that fenced-in center to know what is going on among the new children of Earth, the tiny step-brothers of the mighty Moon.

Mike Mars knew of Goddard; he'd had occasion to communicate with it, he understood its mission, and now it had something to communicate to him. All during the flight up from Florida, Mike had wanted to ask Van Ness what the secret was to be, but the scientist had been rather deep in thought and had seemed reluctant to discuss the nature of their trip. "Let them tell you there," he had said when they started, so Mike had concentrated on other matters.

Now, as their car passed through the check gate of the center and sped on its way to the long oblong of the Research Projects Laboratory building, Mike

knew that the time was at hand. He was the man selected to be first into deep space and they had something he would have to know.

At the building, they proceeded with their guide to a large, low room lined with recorders, walled with instruments whose blank faces registered only the mysterious blinking lights of distant pulsations. "Sit down," said their guide, a middle-aged professorial type of man with thinning gray hair and metal-rimmed spectacles. "We'll have a couple of tapes to run off for you soon."

They sat down, and their speaker, Bryan Crittenden by name, a former college professor now in the service of NASA, gazed at the young man with Van Ness. He liked what he saw, and nodded slightly.

"I don't know what your business is with this, but you have the highest clearance for so young a man," he said. "Did you ever hear of Project Ozma?"

Mike blinked. This was a twist. "Yes, sir, I have," he said. "Wasn't that an attempt to tape the static and sounds of the stars in one region in an effort to find out whether anyone was trying to communicate with Earth?"

Crittenden nodded. "That's the idea. They used the time of one of our largest radio telescopes, located in the mountains of West Virginia, to make a complete tape record of all the static and radio noise emanating from one group of stars over a period of several months. They determined first the likeliest wave length for any sort of interplanetary message to come over—this was possible to do because only certain wave lengths are practical for penetration of atmosphere and message tones. They then taped that wave frequency, and studied the tape to determine whether they could find any pattern at all to the noise that would indicate anything artificial or systematic that could not be put down to nature."

“That was a few years ago,” said Mike. “I understand that the project came to nought. They were not able to find anything.”

Crittenden nodded. “So it seemed, and such was the nature of their announcement when the project was wrapped up. You see, they had eliminated everything which seemed likely to have originated on Earth, and, though they studied the static very carefully, they could not make out anything else that seemed to speak of intelligence. However, we recently went through some of the material they had discarded.”

He got up, went over to one of the machines, started a disc turning. “I am going to play part of one of these tapes to you. Listen.”

In a few seconds there came a click, then the tape began its transmission. There was a squawking noise, then a jumbled-up roar of sound, scratches, rumbles—sounds like the ocean breaking on the shore. This continued steadily, rising and lowering in pitch.

“Typical static, the sounds of radio noise, with no pattern, no evidence of direction except the whim of nature,” said Crittenden.

“I’ve heard the same many times over the radio bands,” said Mike quietly.

“Yes,” nodded the guide. “Everyone is familiar with it.” He held up a finger. “But listen carefully now.”

They were still, listening to the roar and static. Then, faintly under the noise, they heard what sounded like strains of music. It was odd music, not that of the Western World, Mike thought. High-pitched, not quite melodic, sounding something like the curious tones of certain Asiatic instruments, yet not quite like those either. There was an odd beat to it, a curious sort of beat, that set his fingers to trying to

keep rhythm and being baffled by not quite being able to catch the odd beat.

They listened to this odd sound, coming under the blanket of other ordinary static. It wavered, changed pitch, became for an instant almost recognizable as music, then faded out and was lost altogether in the static.

Crittenden reached out and switched off the tape. "We eliminated that bit of odd music as a bounce back from Earth. The moon was passing in the vicinity of our radio telescope as it was recorded, and we hadn't noticed. We assumed at that time that it was a freak bounced off some Asian musical broadcast from the surface of the moon and back to us. Or perhaps a bounceback from the ionosphere."

Mike suddenly began to feel his heart pound. "What was it really?" he asked softly.

Crittenden shook his head. "I told you what we assumed it to be. It was certainly something interposed under the normal noise from space. Then, a few weeks ago, we got another tape sent in here to be analyzed. This is what we heard over this one."

He switched on another disc. This time what emerged was standard code of some sort—dit-dah, click, click—and the standard beat of man-made transmission. Then a high-pitched whine, then a flood of static and the sound of a roaring exactly similar to what they had first heard.

"First, a recorded code message," said Crittenden quietly. "Then a beam of some sort, possibly a directive or satellite beep, then the sound of outer space."

They listened. And once again the sound of cosmic static diminished, and this time again they heard the weird music, the odd, indefinable beat—but they heard it clearer, sharper, and with the strange feeling that this was not, could not be, accidental noises.

The disc ran through, clicked off.

"It sounded the same as the first disc," said Crittenden. "When I heard this, I remembered the discarded piece and looked it up."

"Where did that second tape come from?" asked Mike.

"It was brought to us in the highest-classified secrecy," said Crittenden. "I have since learned that it was secured from a satellite in orbit, not one of ours. I would presume a Russian satellite."

"The first part of the tape is a code message to the satellite from Earth. I have been informed that it emanated from the surface of North America somewhere, not from Asia, and that definitely places the satellite receiver in transit over the Western Hemisphere, not the Eastern. After the code, the satellite received some sort of automatic instruction, then, we think, automatically turned its receiver outward and picked up something from outer space. That something, we have just heard."

"Analysis of the two tapes shows that the two bits of 'music' are from similar instruments and of the same nature. They are not identical, but of the same pattern. The pattern is artificial and synthetic—that is, it is the product of intelligence. It does not have a true musical style, and does not correspond, in spite of certain similarities to our untrained ears, to any kind of music known on earth—in Asia, in Africa, or anywhere else. Clearly it would seem to have originated in space somewhere not too far distant. Not as far as a star, nor perhaps even as far as a planet."

Mike drew back and stared at the silent tape on the black-fronted machine. "You are implying," he said, "that it originated from something in space outside the Earth. Another satellite? Or an asteroid? Or the moon itself?"

He held his breath, and when the answer came, it was what he had begun to suspect.

"We think it came from the moon," said Dr. Van Ness, talking for the first time. "We know there was no satellite near when the tape was recorded on what was known as the mystery satellite. We secured the tape due to the efforts of a certain astronaut . . ." he carefully avoided glancing at Mike, "and we have also eliminated the possibility of an asteroid's being in the line of this satellite's antennae. This music apparently came from the surface of the moon, or very near it."

"And the Russians had it first on their tapes, and knew of it," said Mike, adding it up in his mind.

"Precisely," said Van Ness. "And now you know one of the best-kept secrets of two nations."



"And now you know one of the best-kept secrets of two nations," Van Ness said.

CHAPTER 10

MUSIC FROM BEYOND

MIKE Mars sat in silence for a minute, simply thinking about this. Finally he said, "Are you trying to say that this music, if it is music, came from some other planet, some civilization outside Earth?"

Bryan Crittenden shook his head. "We are not trying to say anything. The scientific method is never to draw conclusions until all the evidence has been gathered and no other conclusion can be drawn. In this case, we are not going to attempt to say where this came from. It is entirely possible that it could be a trick of some sort, or it could be due to some natural cause that we haven't thought of."

"Seems to me that in this case it was a real contact with some other space people," said Mike. "I just don't see how you could draw any other answer. Besides, Project Ozma was started with exactly that in mind."

"Maybe so," said Van Ness, "but between getting the first piece of evidence and proving the origin is a gap we have no right to judge. But that's why you are here. You're going to try to obtain more evidence."

Mike sat back, kept silent. Van Ness observed him, then said, "As the captain of the first team to attempt to circle the moon, you are being briefed on this secret. There will be a recording machine set to this wave length on the Apollo module you will command. In addition to your other duties, you will

have the mission of attempting to pick up further broadcasts of this nature and to get a directional pickup on the source."

"We see several possibilities," added Crittenden. "One is that this music originates on the moon itself. Another is that it originates somewhere in outer space and has nothing to do with the moon. Another is that it originates near the moon, on some sort of satellite or artificial body. Still another is that it originates here on Earth and is bounced off the moon to confuse listeners and make it untrackable. The fact that the Russians have been recording it makes that a possibility. We want to know."

Suddenly Mike let out his breath with a whoosh. "Wow! But suppose it is from another planet! Gee, what that means!"

Both the older men nodded. And then all three were silent with wonder.

The hardest thing for Mike in the next ten days was keeping the secret to himself. Everything he did down at the center in Houston seemed small and easy compared to the secret he held. The tests, the time spent in the intricate study of the Apollo capsule, the arduous exercises on the machines that put terrible strains and heavy stresses on his body, all seemed easy to take after this secret.

He would fall asleep nights thinking of the music from space. It was so different, so unearthly. Even though he knew he was not supposed to jump to conclusions, somehow he knew it had to be from space. It was different; it was eerie. Unconsciously he found he was trying to hum bars from it, but it baffled this sort of recall. He couldn't quite catch the odd tune, even though in the back of his mind it seemed to be still echoing.

Was there other life in space? Were there planets inhabited by civilizations waiting for men to discover

em? Were there new Indias for new Columbuses
to sail to, and new Americas lying unsuspected in
the paths?

He had dreamed of Mars, the mysterious Red
planet, whose desert surface was crisscrossed by
hundreds of spidery lines which might or might not
be the work of intelligent minds. He had dreamed
of Venus, lying unseen beneath its eternal clouds,
which might now be a frightful, hot wasteland, if
earlier reports were right, or still a mysterious
vamp or primitive jungle world, if conflicting view-
points of astronomy should triumph over the ex-
plorer satellite.

And there were other worlds—the large moons
of Jupiter, probably cold and unbreathable; the
contrasts of Mercury, molten on one side, eternally
dark and frigid on the other. There were the stars,
countless trillions of them, and the innumerable
planets that must revolve around them.

Somewhere among those there were worlds that
were habitable. And if habitable, surely then they
were already inhabited? He could see strange cities
in his mind's eye, rising from weird plains . . . cities
of curious architecture, of odd towers and unearthly
walls, standing on plains or in valleys or on mountain-
sides under totally alien skies, while many moons
wheelled overhead, or the rings of a Saturn-like
planet streaked the sky.

He could almost see, in his mind's eye, the towers
of some mighty broadcasting station rising on a peak
of queerly shaped mountains under some purpling
night sky, where strange constellations shone down
on a strange race, sending out the sounds he had
listened to up there at Goddard.

But he did not see in his mind's eye the very real
towers that rose into a very Earthly sky at a place
on the Eurasian continent of his own planet. At the

latest and largest of those towers, the gantries of the largest Soviet launching pads in the Eastern Hemisphere, work was going on.

A new Soviet space attempt was being checked out. Work was going on, night and day, on the latest plan to keep the lead the Russians believed they had. A huge, towering rocket, comparable in many ways to America's mighty Saturn, was being readied.

Three Soviet spacemen talked, standing at the dawn-lit window of their central-control building at that distant spaceport, while halfway around around the world Mike was asleep in the Texas night.

"I was informed today that we have that secret American astronaut Mike Mars out of action," said the general of rocketry. "Our men got to him, and though they were captured, they succeeded in injuring him enough so that they will have to delay their shot a month at least."

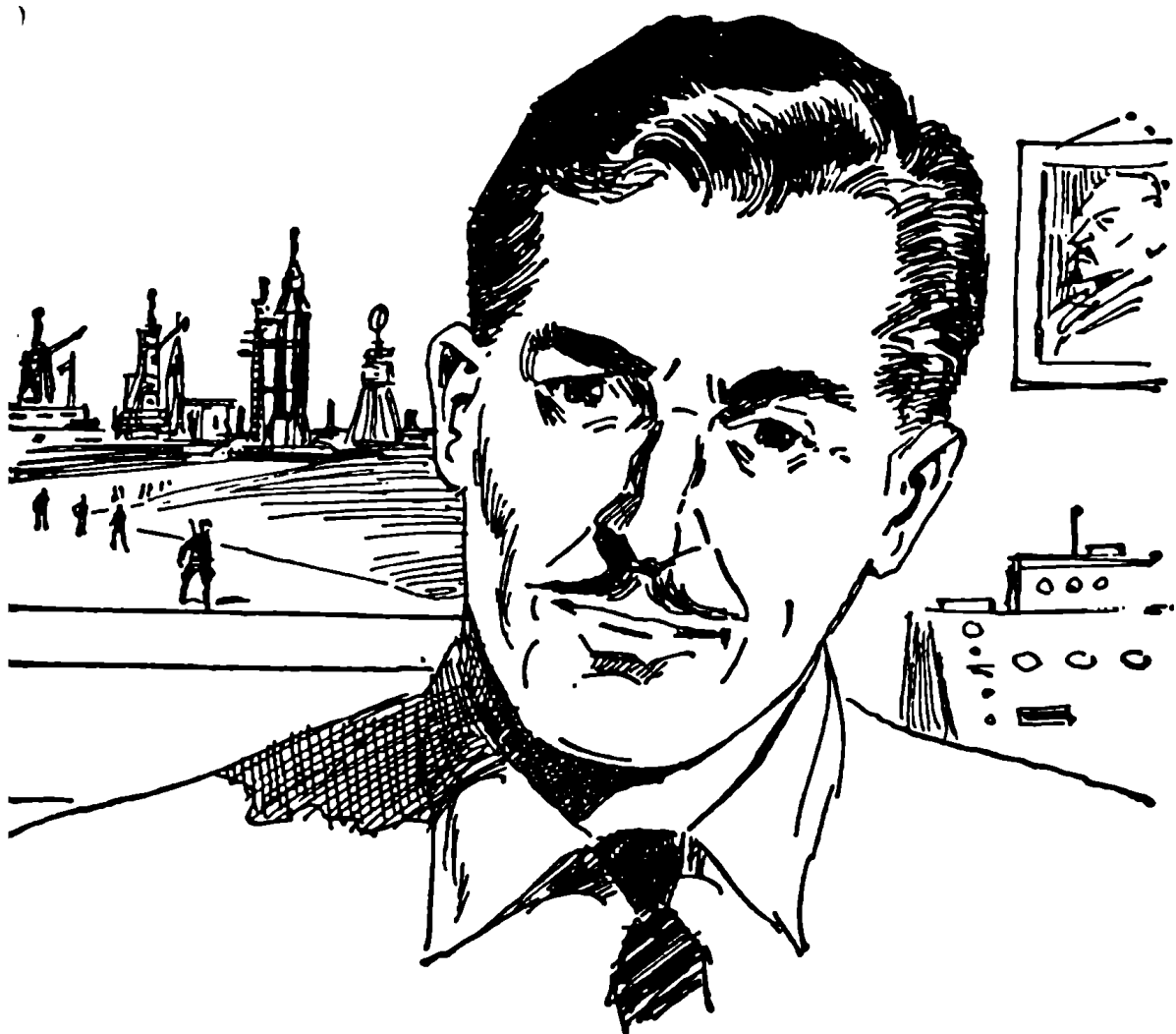
"Very good," said the second, a chief engineer of space attempts. "We will be ready on time, very shortly. We will be first again."

"Ha," came the voice of the third, the dapper, mustached Arkady Kosmodin. "You had better be sure about this Mars. We have been wrong before about this elusive young fellow. Besides, America has other astronauts and other men."

"Our report seems quite certain about this," said the general. "And besides, since when are you afraid of this Michael Mars? It is maybe that he almost knocked you out of the sky the last time you met?"

"Bah," said the cosmonaut, turning angry eyes at his commander. "He never had a chance. He is just a kid with a lot of luck. When I go around the moon, he will be left behind. And if he tries to follow me, I have a surprise for him he'll not forget."

"You mean he won't live long enough to forget," said the space engineer.



'I have a surprise for him he'll not forget,' Kosmodin said.

"That's what I mean," said Kosmodin. "He has just had some luck, but his luck can't go on. You had better be sure your agents gave you the true report. With that Mars's luck, he may just not be so badly injured."

"You are too suspicious," said the general. "Why would our agents give us a false report or fail to catch the right man?"

"Why wouldn't they?" said Arkady. "But anyway, I am here and this time we go on. Will the moon rocket be ready on time? Have you inspected the hecking of the space cabin?"

"Everything will go on time. And we have already

loaded the secret equipment you want for stopping any American attempts," said the engineer.

Arkady Kosmodin smiled and touched his little brown mustache nervously. He looked out again at the work going on in the morning sunlight. The rocket was big and powerful and gleaming. The space cabin was being hauled into place today. He was ready.

On the other side of the world, Mike Mars stirred in his sleep. In his dream the sound of another world's music was disturbed by the noise of a strange rocket and the remembered sneers of a spaceman whose face he could not quite place but who somehow was not on his team.

Soon, soon the contest would begin again. Mike turned over in bed, and in an instant was sound asleep again.

At Cape Kennedy the countdown on the big Saturn rocket was continuing.

In the great expanse of the V.A.B., the voice called, "Forty-eight hours, no minutes, and counting. . . ."

CHAPTER 11

IN THE APOLLO

MIKE Mars rested on his back and was silent. In the earphones of his helmet he could hear the countdown continuing, with less than fifteen minutes to go. He waited, listened, and for those last moments he took stock of his situation.

Here I am, he thought, on the Earth but not for long. Here I am, ready for the first really big step into space, a big one for humanity but a mighty little one where space itself is concerned. I've come a long way, and all because I was born at the right time; I was fortunate to be the right man in the right place. It's true, he continued thinking, I worked toward it. But isn't that the real secret behind any man's success? He has to know what he wants, however small or however humble it may be, and deliberately, consciously aim at it.

I aimed at space flight. Perhaps it really isn't as important as everyone thinks it is. Perhaps aiming at being a good storekeeper or a good doctor or a good teacher or mechanic or engineer is just as important, maybe more so. I'm probably really just out for the thrill, the curiosity of it, the need to see what's out there. But the men who wander from their homes do not always contribute something to those who stay home. I hope I will.

If I come back. They have taken every possible precaution for this trip. They have measured everything they can, they have prepared and tested this

rocket and this space cabin, and unless something goes wrong, it should be safe. But in space there are too many things we do not know, cannot possibly know for certain without going out there.

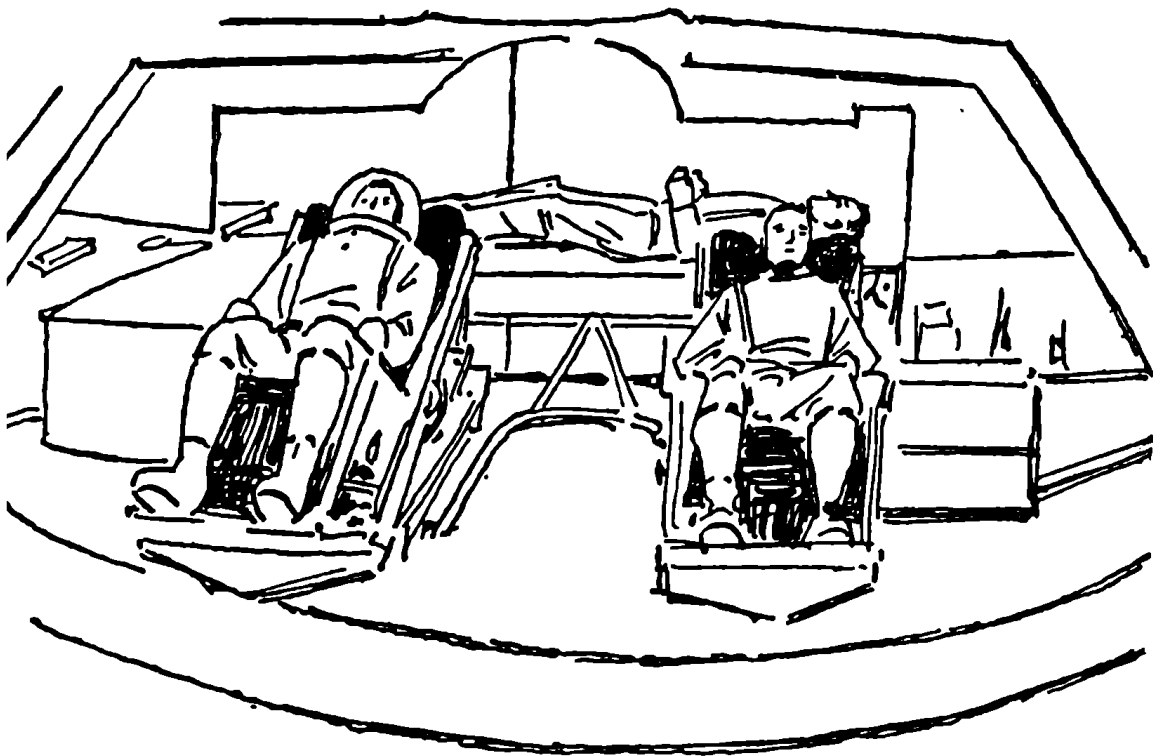
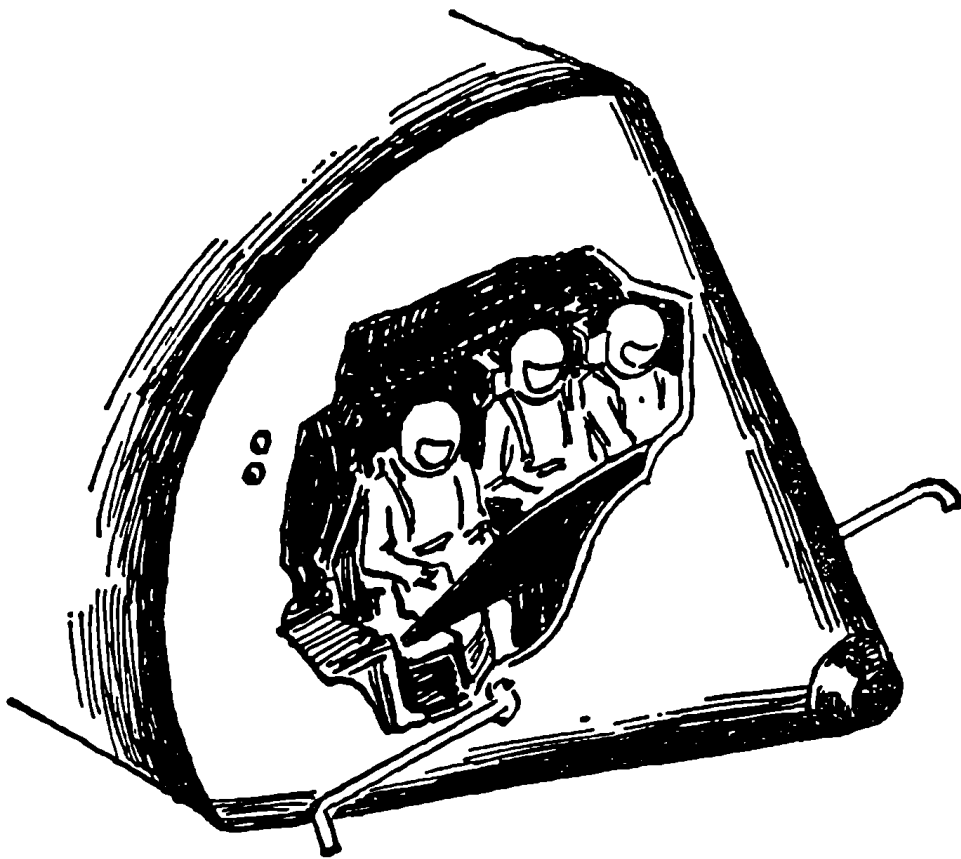
That's why I'm going. I may never come back. That, too, would teach the men who will follow me something. We may never come back, Mike mentally corrected himself.

He did not turn his head, which was encased in his space suit and in his airproof helmet. He was resting in a perfectly shaped contour seat, reclined now so that his back was level with the floor of the Apollo capsule. He knew that two other men, friends of his, pals, sat next to him, within touching distance if he cared to lift his right hand and reach out.

Next to him, reclining the same way, was Jack Lannigan. That was the scientist-engineer's post in the three-man capsule. I'm the pilot, thought Mike, and I'm at the left.

Jack's a good man. He's been with us through the start of Space Task Force Q. He's been with us through the first tests, and through the X-15 studies, and through the suborbital jumps. He's been in orbit and he's worked on the Gemini flights. He's Navy and he's okay.

Then there was Johnny Bluehawk, copilot, on the other side of Jack Lannigan. Johnny is probably looking up, even as I am, and maybe he's thinking of what's coming. I'm always proud of knowing Johnny, Mike thought. He's an Indian, a descendant of the original Americans, and he made his bars in the Air Force from a start in poverty and with a lot of people who are prejudiced against anybody a little different from themselves against him. But that's the Air Force—no barriers to any good American who has the guts to fight it out. And Johnny's here, by my



Inside the Apollo.

side, the best friend I ever had, a Cheyenne warrior and a space pilot to ride the orbits with.

So there's the three of us, three friends, all set to go out into the untracked emptiness of the most dangerous and deadly ocean ever known, the endless ocean of the universe.

Twelve minutes to go. Mike noted the count-down.

Then there's the Apollo. Here we are riding on top of three hundred and fifty feet of engineer genius. Carefully measured metalwork, each inch measured and studied and tested, each of the innumerable wires and pipes and tanks checked and rechecked, and each the best that American ingenuity can devise—and still there's the factor that could lead to trouble, the unknown, the uncertain. We're ready to blast off, and we've studied for our jobs.

I haven't studied enough, Mike thought. That was the one flicker of fear in him, and it was a flicker that secretly worried each of the three. We could have used a year of study and we got only a small part of that. We have to rush, we of the Q astronauts. We'll get no publicity, we'll get no parades, and the medals we may get will be given in secret or maybe when we're old men and the government finally tells the world what we did when we were expendable. We're the ones they risk in secret—America's secret team.

Out there, down there, there are lots of people who will see this flight go up. They've been gathering at the Cape and along the beach and across the canals for a day now. Somehow the word gets out. But they only think that a Saturn's going to be tested. A full-scale test, but they don't know there are three men in the capsule. That's why they picked a night shooting. We came over in the van, where we were suited up, and it was dark.

I always get a thrill out of the searchlights that spot the huge rocket, and this is the biggest. I get a thrill at the lights in the darkness and going up in the elevator in our suits into the dark sky with the ground floodlit below.

They kept the lights off us, and they kept the capsule dim when we slipped in and took our places. And now only the men in command in Central Control and the few technicians who helped us in know we're here. By now we're alone on this pad and the nearest human being is safely behind the concrete and steel of the blockhouse so very far away.

Nine minutes and counting.

This is the Apollo capsule. It's awfully small for us. We've got to live several days in here and it's hardly any more space than a couple of phone booths. It's twelve feet high and it's thirteen and a half feet across at the floor. But it tapers, comes up to a point like a little Indian tepee. If we stand up we have to be careful not to bump our heads, and if we move around we have to slide past each other as if we were dancing.

It's a wonderfully complex thing. I can see the control panels, can reach out and touch the dials if I want to, though I can control them with my hands from the buttons set in the arms of my seat. This one will start engines, this one will stop them, this will . . . mentally he reviewed for the umpteenth time each of the controls.

He could see the thick glass window slits. That was a concession. They could see directly out, as well as being able to use the television eye for rear visions. He could make out the tightly bolted door of the airlock hatch—a real airlock such as spaceships always had in the storybooks. This Apollo has one because it's necessary in deep space if you're going to be there for any length of time.

The walls of the Apollo were steel and aluminum, honeycombed for extra strength. The water supply, the water tank, was a part of the wall, inside the wall, to serve as extra protection, as special insulation against radiation.

That was another unknown factor, Mike thought. Radiation. The worst would be encountered on their way out, after they had orbited.

The three had been injected against it. What the stuff was, he didn't know for sure, but there had been experiments and it seemed something had been developed which would offer a little protection for the blood stream against the hazards of space rays. The capsule walls should cut off a lot of it, and the speed with which they would cross the worst of the radiation belts around the earth should do the rest.

So far the best that was possible had been done to protect the three against radiation. This trip itself would supply a lot more information about that. They had delicate instruments which would telemeter back to Earth, second by second, detailed counts of the rays that would bombard their little ship and pass through it.

We're ready, thought Mike. Ready enough. As ready as we can be, considering.

Four minutes and counting, said the voice from the Central Command.

"Everything in order, men?" said a friendly voice, that of Dr. Van Ness, coming over his earphones.

"A-O.K., sir," said Mike.

"All systems GO," said Jack.

"Ready for blast," said Johnny.

"All right then. We all wish you luck. Give my regards to the man in the moon, when you pass him." Merlin Van Ness tried to make his voice light, but Mike knew he was as tense as they were.

"Keep a light in the window," said Mike, trying

to match him in coolness. "We'll be home in a few days."

The man in the moon, Mike thought, and heard the countdown go to two minutes. Is there a man in the moon who plays strange music on strange instruments and broadcasts it to mysterious satellites? They'd listen for him and maybe they would really give "him" the regards of NASA and the USA.

One minute, then thirty seconds, and Mike was cool and calm and relaxed as his training had taught him, so was Jack and so was Johnny, and the countdown came to six seconds, and then finally to zero.

CHAPTER 12

L IS FOR LUNA

THE takeoff was easy, Mike thought, as the pressure steadily increased on him. The size of the rocket made it even more controllable. He let his body rest, as he had learned to do so often, and he watched the meters as the automatic controls relentlessly ticked off their built-in commands.

Steadily the gigantic missile rose and steadily the ground of Florida drew away, faster and faster as they rose. From their seats, the three young men could see the picture in their little television view-plate, and though it was shifting and blurry, they knew they were rising into orbit.

The pressure grew, as it always did, and as it grew it seemed that the time dragged on. Though it was but a matter of a scant few minutes, under the tension of the increased G's that the accelerating engines put on them, they lived through every second as if it were an hour.

Below them, in the first stage, nearly a million pounds of fuel blasted away, lifting the heavy weight of the largest capsule Americans had ever built. Then came a moment of tension, when for an instant the pressure was relieved.

Mike managed to speak, though it was not necessary, as he knew that everything that went on in the Apollo at this stage was being monitored. "First-stage burnout," he forced between his lips. "Second stage ignited."

The pressure regained as the additional booster began to push the load into orbital velocity. Now the giant missile had begun to flip; no longer straight up, it was proceeding on a lateral course, around the world, and then, after more agonizing moments, another click, and the second stage had burned out.

"In orbit," said Mike, looking at his dials.

"Check, please," said a voice Mike recognized as the Bermuda telemetering station.

Carefully he read off his readings, and Ground Control read them back, checking. Even as they spoke, Ground Control's voice began to fade, until another voice took over, on the next line of stations.

"Three-hundred-mile-high orbit," said Johnny Bluehawk. "That's a marker for us already."

"What's the radiation count?" asked the latest ground-control voice, relaying instructions.

Mike looked. Not very much, so far. They had feared a higher reading, but thus far nothing much was registering inside the ship. Reading on the skin outside was higher, and he noted that.

"That's a good sign," said Jack Lannigan to Mike. "Our insulation is working out, evidently."

"Good," said Mike. "I was sure our engineers had planned it right."

They shifted in their seats, for they were now in free flight, and no gravity was working on them. Johnny unstrapped his seat belts, moved a bit. The others followed suit. They took stock of the situation.

They were traveling over the Atlantic, eastward to the coast of Africa. They were in orbit around the world now.

Below them the planet spread out, and they could see the curvature of the Earth below them. They could see the crescent line where the rising sun would be and below them dark oceans, lit by a faint glow

of stars and by the light of the moon, which was about three-quarters full.

They were silent as their temporary satellite moved closer and closer to the sunrise belt. For a few minutes all three were again caught up by the wonder and awe of space. Then suddenly Johnny gave a whoop. "Yoweel!" he said. "We're up and we're heading outward. Why so serious?"

The two others laughed suddenly themselves. "I guess we were a little tense," said Mike, even as the buzz of another ground station came on.

Once again he read his dials to the ground.

There was a click and the voice of Van Ness came on, relayed through three stations from his post at Cape Kennedy. "We are starting your next countdown," he said. "The time is L minus thirty."

"L minus thirty and counting, sir," said Mike, all business again. At a motion of his head, the other two crew members settled back into their seats and re-buckled their suits.

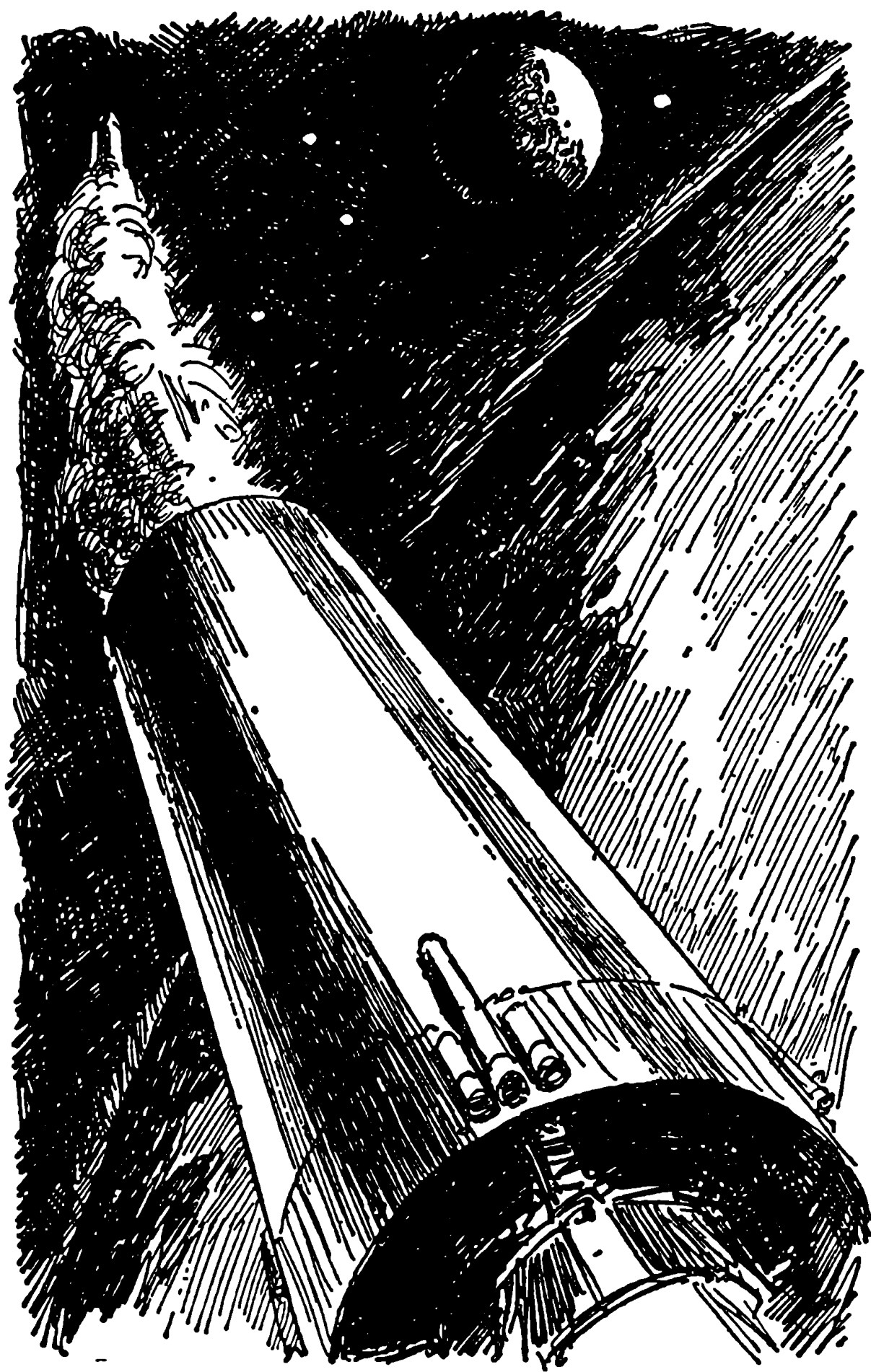
As Van Ness's voice faded out, Johnny said, "What does L stand for?"

"L is for Luna," Mike said. "We'll have our second blast-off soon. This time from Earth itself."

They concentrated on their vehicle. Below them the Earth shifted features, and Africa vanished to the westward and the sun shone down on the Indian Ocean. Australia was approaching and the moon was out of sight of their Apollo now.

"L minus fifteen," said Mike, and Australia was past and they were heading over the Pacific, back toward Hawaii and America.

Back at Cape Kennedy, men hunched over their instruments and the three directors of the Q team consulted. "Everything is in order," said Van Ness. "Shall we give them the go-ahead?"



"Their bodily readings are excellent," said Dr. Holderlin. "We have three good men up there."

Colonel Drummond nodded. "There's nothing stopping them. If we can do it, they are the ones. I wish the world could know of what they are doing."

"We can't tell them. Some day the story will be told. Meanwhile we have a race to win," said Van Ness gravely.

In that other great rocket center of the planet Earth there was sudden activity in their control headquarters. A message had come in from a Russian observation ship in the Pacific. The Americans had something new in orbit. It looked like a big one.

The leaders consulted. What was this? A scientific-research satellite? Or a launching missile for a robot planetary observer, another Mariner perhaps? Or was it something else, something they feared would happen, like a manned test.

"It can't be a moon attempt," said a general of rocketry. "They are not ready for it. They cannot be ready for several more weeks."

But it could be and it was. "L minus five," said Mike, and the three men in the Apollo began to feel a new sort of tension.

Rapidly the minutes and seconds counted further. They were almost around the world and the moon was crossing the horizon. Below them day was done and the line of twilight was advancing rapidly.

"L minus one minute," said Mike. "Ready, everyone?"

They were set.

The seconds counted down. Mike reached for his board, placed a finger on a button. He watched.

"Attitude is GO," said Johnny.

"Propulsion system is GO," said Jack, watching the

readings of the third stage's engines, now connected, and waiting the signal.

"Three, two, one—GO," said Mike, and pressed the button.

The engines of their third stage ignited. They were again thrust back in their seats. The Apollo once again came to life, and out there, three hundred miles above the Earth, entering the twilight zone of the world, they broke out of orbit, gathering speed.

They were on their way to the moon.

CHAPTER 13

REAL DEEP SPACE

MIKE watched his meters, his hand on the control button and his eyes seeing the clicking seconds speed past on his control board. Second by second the pressure grew as the rockets roared their power and tore the spaceship away from its closed orbit, tore it farther and farther out as it orbited until it would reach the carefully predetermined speed and direction.

Second by second, and then, even as the control panel flashed a red light indicating the automatic control was counting, Mike's fingers let up and the engines ceased. The second acceleration was over. It had not lasted long, it had not caused the discomfort and pressure, but it had done something no other human-carrying flight had done. They were on their way to another planet.

Mike continued to rest silently, and by and by the voice from the Earth station came in. "Report please. Please check down with us."

The voice was as clear as usual. They were not far from their previous orbit. But they were rapidly rising.

"All in order," said Mike. "I will read off my position and situation." He began. The voice from the Earth checked it figure by figure.

"Good," said Ground Control. "We agree. You're on your way. Good luck, fellows."

"Sure thing," said Mike. And the voices of the other two chimed in.

They were weightless again. Mike turned his head, glanced at the others. Jack was smiling to himself, as if to some secret happiness. Johnny was calm, quiet, thoughtful.

"Want to swing your chair back?" Mike asked Jack. "We can get to work now. Keep our eyes on things. Try our wings, as it were."

Jack unstrapped himself from his contour seat, slid himself out of it, turned and adjusted it. The seat pushed back on silent gimbals, slid behind the other two and sideways. It was now out of the way of the controls, allowing a little more room for the two stationed there to move about. Flat and behind them, it would serve as a resting place for one of the three.

"How's the radiation?" asked Jack, already at work setting up instruments.

Mike was watching it. "Rising," he said. "I hope they've figured right."

Jack craned around to look at the board, while Johnny watched his duplicates. The radiation count on the exterior of the shell was up, rising steadily and quite rapidly. The counter on the inside was still low, though it too had moved a bit.

"I think we're going to make it," said Mike. "We should be out of the first and most dangerous radiation belt in a short while."

"We'd better be," said Johnny. "In spite of precautions, this is the only really unknown factor here. They count on speed in passing through it. It's like being X-rayed, you know. A little isn't very risky, but a lot can be mighty unhealthy."

"I give us another minute in this area," Mike remarked, glancing at their altitude estimator. "Seven hundred miles from the surface and moving fast."

They watched now, silently, as the Geiger counter

outside the ship continued its frantic counting. They were passing through a zone of dangerous cosmic radiation concentrated around the outside of the Earth.

"We could have taken off from above the South Pole," said Johnny. "Would have beaten this radiation. You proved that."

"Yes, said Mike, "but it represented too much of a problem. We're not ready for a polar launching yet, and we don't have the Apollo setup anywhere but Cape Kennedy. We had to take the chance."

They waited, and, below, the watchers from the Cape waited; and by the end of five more minutes, the count was going down, dropping fast.

"We're out of danger," said Mike over his speaker. "Our count is now almost normal. A little high, but nothing is getting through to harm us."

A voice, fainter, but identifiable as that of Dr. Hold-erlin, came back. "It should be safe then for you to remove your protective suits and get comfortable."

"Good," said Mike, giving a low whistle of relief.

Switching off, he turned and laughed. The two others cheered and began to fumble with their helmets. It was a race of three laughing young men to get their binding, clumsy outfits off.

No matter how well built space suits are, they are always tight and confining. They have to be. You can get used to them, but it is always so much more pleasant to peel off and get comfortable in shirts and shorts. And the cabin was warm.

Johnny noticed that first. "You know," he said as he slipped back into his seat, "it's hot in here. The suit was air-conditioned, but what's the matter with the cabin?"

Mike glanced at his registers. "Eighty-five in here," he said. "You're right." He hastily went over the controls. "The conditioning seems to be functioning."

Jack Lannigan heard this. "Hold on," he said. "I'm the engineer. Let me check." He twisted around, worked his way to the location of the cabin conditioning system, and got the top open. "It's functioning all right," he said after a quick inspection.

"Heat's dropping now," said Mike.

"It must have been a side effect of the radiation belt," said Johnny. "Something to note. It must have been hot out there. That possibility had been mentioned, you know."

Mike had been worried a moment, but now he nodded. "Yes, that's our number one discovery," he announced. "We're all right again."

The voyage continued. There would be nothing to do about controlling the space vehicle for several hours to come. It was traveling in its predetermined orbit on its momentum. As it moved away from the Earth, it would slowly lose speed, the drag of gravity pulling on it relentlessly. But at the point where that drag-back should finally start it falling, it would be so close to the moon that the lunar gravity pull would be stronger, and it would start falling toward the other heavenly body.

However, so balanced was its trajectory that it would not actually hit the moon but circle around it, swing in orbit, and then once again reach a point where the Earth's gravity and the moon's would be equal. At that point a touch of the rockets would take it past and once again under the control of Earth.

This was how it should be in theory. But when the point of equal gravity came on the outward turn, it would require a guiding hand to correct the errors that even the best machines can make, to make certain that the Apollo did proceed as wanted and that some faint difference between estimate and actuality did not endanger everything.



Meanwhile the three were free to conduct experiments.

The Earth slowly grew smaller. There had been photos radioed back to Earth from unmanned satellites and robot space probes, but they were nothing compared to seeing the mother world with the naked eye.

Never before had any of the three—all veterans of orbital flights—seen Earth from the new distances they were achieving.

It no longer filled their viewplate. They could see all of it as one vast convex surface, partly dark, partly sunlit, the dark side faintly glowing from the diffusion of starlight and moonlight and the faint reflection of the surface, the light side brilliant with color and sharp in outline.

The glowing band of the atmosphere could be seen, and they were definitely out of it and above it. For the stars edged the Earth and shone cold and unwinking in the blackness of a space darker than any of the three had seen before.

"Outer space," said Johnny. "Real outer space."

Hitherto, even at their highest orbits, space had never been absolutely black, but a deep blue verging on it. But it was black now, black with the almost complete absence of any gaseous matter. "A molecule of hydrogen every square inch," said Mike at one point, "is what the astronomers estimate is the vacuum of space."

"Probably thicker here," said Jack Lannigan. "We are in space between two planetary bodies, and there must be many more molecules trapped here and carried along, even at this distance."

"Fifteen thousand miles," said Mike, "and gaining mileage every second."

"Telescope is ready," said Jack.

"Cameras to the fore," said Johnny.

“Let’s get some observations going,” said Mike. He paused and then added, “and who is going to go to sleep first right after that?”

“Awk,” was Jack’s comment. “Can’t we all stay up?”

Mike shook his head. “Orders and discipline,” he remarked. “We have a long trip. One is going to rest. Let’s get the pictures.”

CHAPTER 14

EMERGENCY AWAKENING

MEN can endure anything, and even in the novelty of living in space, life must go on. In another few hours, the three friends were at home in their cramped quarters and carrying on as if they were still in some simulated cell back on Earth. They set up their sleeping turns, and while one rested, the other two conducted the series of observations and tests that had been assigned to them.

Although the best observation positions in the capsule were the viewplates at the control seat, any part of the heavens could be scanned by changing the attitude of the craft. Tiny jets of compressed gas, spurted out from the sides, would alter the position of the huge capsule. Without changing the direction and trajectory of the ship itself, this process could spin it to observe anything.

Hence, periodically, observations were made of the receding Earth, each time a new and awesome scene. It was assuming the appearance of a planet in space, no longer a surface but a world. Its size, even at the distance of halfway to the moon, was still tremendous compared with any other object, but it remained a marvelous thing of shifting blues and greens, of streaks of mist, of gleaming white poles and darkening shadows.

A regular series of photographs recorded this for their return, and the telescope set up inside could

pick out features from the entire hemisphere facing them.

The stars shone all about, clearer than they had ever been seen from Earth, and these too were recorded and photographed, with hopes that astronomers who might study them later could perhaps make new discoveries from them. The sun shone sharp in the black sky and with its flares and corona was startling and impressive.

“Our photographs of the sun alone will make the astronomers leap for joy,” said Mike once. “They only see the sun’s corona during the rare periods of a total eclipse, and here we are in space, seeing it all the time.”

And there was the moon—steadily growing larger, steadily gathering depth and coloration and taking shape. Darks and lights, no more man-in-the-moon effect, but visibly the sharp edges of mountain ranges, the deep, shadow-edged ring walls of wide craters, strange streaks of white and gray across the “sea” bottoms, cracks and ridges, and here and there colorations. No longer the white, gray, and black seen from Earth, but in the clarity of space, it could be seen that faint traces of yellow tinged parts of it, with here and there hints of greenish blue, or even slaty pink, and now and then a glistening, brilliant spot of white which was probably the flash of the sun against some exposed bed of frozen gas or crystal.

Looking at the moon gaining and growing was the thing that began to stir each of the three young men. There was something about watching a whole strange new world come into their vision that caused the heart to beat faster and the mind to swirl. Here was a land waiting for exploration. Here was adventure unreeling for the next few years. This was greater than the discovery of America, greater than the epic

of Antarctic exploration. This was a whole world to be won.

Mike scanned the radio bands for the mysterious music he alone was on watch for, but there was nothing. The sky was full of the static of outer space, the roaring and grumbling of cosmic radio noise, but of anything like artificially originated sound, nothing.

Communication with Ground Control was becoming difficult. Static was accumulating and voices came through only occasionally with clarity, at other times seeming to fade and become inaudible. They talked about this and it should not have been so, but this was a pioneer trip.

"We may have picked up some kind of charge during the passage through the Van Allen belt," was Jack's opinion. "This may be interfering."

"Or perhaps it is a defect in our equipment," said Johnny, "but the risk in searching for it is not for us. Ground Control said not to try."

So they did not hear the desperate communication that Van Ness tried to transmit to them thirty-six hours after they had started. It began with a report from several of America's radar observation stations along the DEW line and along the perimeter of the Soviet world. A rocket had gone up from the great Russian rocket base. It was not a rocket in orbit. It was a space prober, and it seemed almost at the start to be one that was calculated to reach the vicinity of the moon.

Shortly after these observations, confirmation came in from Jodrell Bank and from other observers around the world, and there was no doubt that the Soviets had something on its way toward the moon.

Van Ness conferred with others. "There's something not quite right about its path," he said. "Our calculations indicate that it will not quite reach the moon, will not pass it, but will reach out about a hun-

dred and fifty thousand miles from Earth, and then will start falling back. It can hardly be a practical observation rocket."

"It's premature if it is their heralded manned moon flight," said Colonel Drummond. "Perhaps it is just to check up on our own effort."

Van Ness shook his head. "Doesn't make sense. They can observe our Apollo shoot from the ground just as easily. See here," he continued, spreading out diagrams of the Russians' plotted line of motion and also of the path their own circumlunar rocket had to take. "Do you notice this? That their rocket will reach a point between Earth and Moon that our own ship will pass through on its return? Does that mean something to you?"

Drummond studied the two lines of motion. Slowly he nodded his head, and his mouth drew together in a grim, thin line. "I see, and it suggests something to me as a military man that I don't like. Would they dare to do it?"

Van Ness, now equally grim, nodded. "I think they would. Who could prove it? These flights are all risky. All we could say is that Mike died a hero. We don't even admit we have a rocket on its way, so how could we argue about it?"

Drummond stared silently awhile, then voiced his thoughts. "If their rocket—and I suspect it must be manned—can reach that point of intersection first, can strew it with mines and leave them in orbit there while it returns, Mike's Apollo will draw those magnetic mines as honey draws flies. The Apollo will go *poof*, and people will say it was a meteor or an accident."

"And then the Russians can make their own moon flight with a lot of publicity and claim once more to be first," finished Van Ness.

"I think we'd better phone Washington and see

if we can do something about this," said Drummond.

"What can we do?" said Van Ness. "How much time can we have?"

Drummond looked at him. "We have a second team of astronauts. We have a couple more of Saturns at Cape Kennedy, always readied and requiring just a few hours fueling and checkout. We can send up a team to do something about it."

Van Ness stroked his beard. "To do what?"

The colonel snapped erect. "I don't know yet, but we're not going to do nothing. Watch our smoke!" He strode out to the phones.

Hart Williams was dreaming of a moonscape with weird creatures walking about and himself trying to climb a moon mountain. In his dream something was dragging at his space suit, and every time he tried to take a giant moon step upward, he would fall back. He became aware in his dream of a loud roaring in his helmet.

Suddenly he seemed to be falling, and he opened his eyes with a snap and sat up in bed. The light was on in his room at Skyhook and Dr. Holderlin in pajamas and bathrobe was pulling at his shoulder. "Get up," the doctor was saying, "all get up. We haff emergency business."

Now wide awake, the handsome Air Force pilot came into full control of his mind, the dream vanished, and the reality of the after-midnight hours fell on him. He heard someone waking up Orin McMahan and Joe Stacey, who shared a room across the hall. Lights were going on all around.

"What's up?" he asked, and, not waiting for the answer, was out of bed and climbing into his clothes. "Is Mike in trouble?"

"Not yet," said Holderlin. "Not yet, but he might be soon."



"We haff emergency business," Dr. Holderlin said.

He left the room, and in a minute the three Copernicus team men were bounding down the stairs and gathering in the project room. Holderlin was waiting, and two of the technicians joined them, all in their sleeping clothes and slippers, their hair tousled, and rubbing their eyes.

"Can you three astronauts take off for space in five hours?" Holderlin popped at them.

The three goggled at him, then stiffened. "We can, sir," said Hart for all of them. "We're ready and able."

"I think you can too," said the doctor. "So be ready to go from here in ten minutes. The planes will be waiting at Orlando. Here's what's happening."

Briefly he told them of the situation with the new Soviet rocket. "And we are not able to get through to Mike to warn him of this," he finished.

The three spacemen, Mike's friends and comrades, all at once and all together became cool, calm, cold, and deadly. "We're on our way," said Orin.

CHAPTER 15

SEEDS OF DESTRUCTION

OUT in space, Mike opened his eyes. For an instant he did not recall where he was, only that it was a delightful sensation simply floating on air, like a cloud in the sky—which had been his dream. Then his attention focused on the back of Johnny Bluehawk a few inches from his nose. Johnny was quietly sitting in the pilot's seat, watching through the eyepiece of a telescopic camera and occasionally clicking the shutter.

Mike's four hours of sleep were over. He deftly swung himself up, first unstrapping the belt that held him from floating off. He wasn't in his space outfit, nor were his two companions. They were in shorts and shirts, their tightly restricting suits removed for comfort.

"How's it going?" Mike asked. "Anything unusual?"

"No emergency," said Johnny. "I'm getting some nice moon shots. The view is getting better and better. Our automatic cameras are taking all this, but the pros at NASA asked me to take some special shots of certain craters and features. Take a look."

He edged aside and Mike craned over the back of his seat and looked into the eyepiece. The camera was focused on the bottom of a crater, and he saw that there was a deep cleft there, a break in the smooth grayish surface at the bottom of the high, barren, mountainous walls. The cleft was a veritable

chasm, a deep crack, and the darkness of it hinted at great depths.

"See the faint edging of pale green along the upper left edge," said Johnny. "Does it seem as bit fuzzy, even in the scope?"

Mike studied it, and he saw what Johnny meant. There was a section along the edge of the dark crack that just wasn't sharp and clear, even in the powerful lens of the telescopic camera. It was as if something had gently smudged the edge, and there was a hint of green in the grayish coloring.

"That sort of suggests that there's a deposit of something there. Perhaps a sort of gas escaping, or maybe some frozen gas," Mike said. "You remember from studying the moon that some astronomers think that gas sometimes escapes from hidden pockets or caverns under the surface?"

"I remember that," said Johnny. "I guess this is why we were asked to take this particular spot on camera. Even in the airless clarity of outer space, it looks as if there's something obscuring that little bit of the surface."

"Makes you get kind of excited about the place," put in Jack Lannigan from the other seat, who had overheard everything. Nothing could be said in the tiny, cramped quarters that was not directed at all three. "If there are gas pockets under the surface, maybe someday we can explore them. A place like that, a protected cavern under the crust, would be a good place for a moon base, or for exploration headquarters. Would save building a surface structure."

"Next time we come up we'll have to land and have a look," laughed Mike. "Anyway, it's your turn to retire."

"What!" snorted Jack. "And miss the view? Man, it's getting better every time."

Mike looked out the viewplate. The moon was

close, and they were passing it by. Their orbit had carried them to the closest point of the satellite and now they would swing around it, a few hundred miles above the surface, and then head back for Earth.

"Retro controls were in operation while you were asleep, Mike," said Johnny. "A minor correction, but we're on orbit again."

"And the radio is still out," said Jack. "Can't get anything but static. I'm transmitting our own reports regularly though—maybe they can pick us up."

Jack unbuckled his seat belts, slid out, and he and Mike changed places, edging around each other in the narrow quarters like a pair of dancers. Jack slid onto the sleeping section and, performing still another dance, Mike and Johnny changed places.

"Keep your eye on the attitude and position, Johnny," said Mike. "I'm going to take over at the cameras and telescope now. You've had your fun."

"I'll see plenty as it is," laughed the Cheyenne. "Besides, aren't you hungry?"

"Now that you mention it, I am," said Mike.

The Cheyenne reached out and began unpacking rations for the awakened pilot. "Ycur turn to eat," he said.

Even while Mike was eating from the tubes of compressed food, he never brought his eyes away from the wonderful scene, any more than his copilot could take his eyes from it. For the moon close up was even more breathtaking than the Moon from Earth.

Its bulk now occupied most of their view and they seemed to be moving swiftly across its landscape. Now part of a great lunar "sea" was filling most of their vision, and they could see across hundreds of miles of washed out, flattish wasteland. Here and there a tiny pock of a meteor strike broke the de-

ceptively flat surface, and the cracks and rills of breaks and spidery wrinkles split the surface, giving hint of the turmoil that once racked the surface of the smaller world.

The seas of the moon were so called only from their appearance to the ancient astronomers. Had the moon had water, probably it would have filled those wide, shallow plains which were lower than surrounding mountain rings and the plateaus of craters, but the moon had no water as such. Only exploration would detect whether it had ever had water. Spots of glistening white occasionally were seen which might hint at ice pockets, but these were things to be seen by the keen eyes of astronomers, not by casual observation.

There was no water evident on the moonscape passing under the boys' noses now. Instead, the grayish cast of plain sometimes rilled in a way that looked like frozen stone waves.

"Is it dust that fills that surface? Or is it just hard-packed stone?" mused Mike.

"Nobody knows," said Johnny. "Our radars are probing it as we go. When we get back, our tapes will be analyzed. Maybe they'll know then: This is a historic trip."

"If we get back," said Mike. "The hardest part of our trip is coming now. We're passing out of sight of Earth, you notice. We're passing into the far side of the moon now."

The Cheyenne was silent, watching the controls, watching the view. Earth, a round, gleaming ball, was nearly touching the horizon of the moon, and sinking steadily. This was the visual effect of their orbit, for they were now going around the moon, putting it between themselves and their home world for a few hours.

This was the moment of drama, of farthest

travel, of the loss of contact with home. They both fell silent, struck by this realization. Behind them the deep breathing of Jack Lannigan gave evidence of his disciplined control. He had made himself sleep.

Arkady Kosmodin was not without a sense of the grandeur of space. He was impressed by the closeness of the moon, and he too was taking pictures of the surface. But he was not as close as Mike, nor would he be.

"Zveri," he said, addressing his copilot, the only other member of his crew, "we will astound the world with our marvelous pictures. They will applaud our daring in coming so close to the moon for strictly scientific reasons, eh?"

The other man laughed. He was a rather chunky blond man, high-cheekboned and narrow-eyed. Copilot of this special rocket trip, he knew the man who was his commander and recognized his special sense of humor. "Yes," he replied. "It is very courageous of us to make this expensive trip just for some pictures. We are real camera bugs, eh?"

"Bugs?" said Arkady. "That's right. A good word. And we have some bug powder to spray in space soon. There is a big beetle up there somewhere we want to catch."

Zveri shrugged. "It's too bad. I wonder what pictures they will have taken from the other side of the moon?"

"We hope nobody will ever know. The only pictures the world has were taken by our Lunik, and so far the other side of the moon belongs to us. We don't want them poking their noses there until we find out ourselves what the rest of the story is on that side."

"We have named the biggest features ourselves," said Zveri. "We should name all the rest—the little craters and mountains that our films did not catch."

“True, true,” said Arkady, looking at the huge, imposing surface of the moon fifty thousand miles from him. “And this is as far as we go. We begin our return swing.”

The two men worked quietly and efficiently for the next ten minutes. Spouts of compressed air turned the Soviet space capsule around, a jet of rockets stopped it in its movement, shifted it, and another jet started it on its long fall back to Earth. They worked well, the two Russians, for both had trained long and were experienced cosmonauts.

“We are on our way now on our return orbit,” said Arkady. “It’s time for the little seeds to be planted.”

Zveri indicated the lever. “You do it, if you want to. I can’t say I like this sort of thing.”

Arkady frowned. “There’s no place for softness here. We’ve got the universe to win—big prizes don’t go to weakling hearts. Watch me.”

He reached out to his control board, flicked a guard switch over, released several buttons which had been specially built into the control panel. “A hasty job,” he commented, “but it will work.”

He kept his eye on the position indicator for the time. At the right moment he pressed the first button, counted, then the second, and so on.

As the Soviet capsule fell back toward Earth, a small cloud of tiny metal objects slid away from it and spread out in its path, following it slowly.

Its trajectory, out there near the moon-earth equilibrium patterns, was seeded—with tiny explosive magnetic bombs.

Arkady laughed softly as the last button of his bomb-placement panel was flicked.

The Soviet capsule moved silently on, back to Earth.



"It's time for the little seeds to be planted," Arkady said.

CHAPTER 16

CRATER JOLIOT-CURIE

THE Earth was invisible. This was the thing that made everything different somehow. The Earth could not be seen. It was out of sight.

When in the history of mankind, as far back as ever man had walked the world, was his home planet ever out of sight, out of contact? When even in the limited history of space flights or orbits, had the Earth ever been entirely out of sight?

It was now. For three men in a small metal shell, the world on which they had been born, the world on which their ancestors had been born and lived and died, was not to be seen.

The moon had passed between them and the home world. Earth had *set* for them, just as the moon had set for the people on Earth a million times. Mike and Johnny, in spite of the marvels of the strange moon-scape beneath them, had found their eyes fastening on the greenish-blue, glowing disc that was the Earth and watching it as it touched the horizon of the jagged gray world, watched it sink, watched a line of lunar mountains eat into it, and then saw it vanish behind those mountains as the edge of the satellite passed beyond them.

At that moment something changed. They could not say exactly what it was, but it was a moment of great feeling, of mood, of something that got into their throats so that for an instant they both felt a touch of fear.

It was like the first time they had gone to school, as little boys, and said good-by to their mothers at the doors of the strange big building. It was like that.

It was like three boys at long last going out into the universe, turning their backs on their mothers for a short while, relying on themselves now.

Mike and Johnny sat in silence, each unable to quite say what was in their hearts. Then Mike turned, looked away from the cold edge of the moon and toward the darkness of space.

"We've ventured into the biggest ocean of all eternity," he said to Johnny. "Can you feel it? We're on our own at the edge of an ocean whose shores touch a million unknown island worlds—and now we're in it, our feet wet, ready to set sail."

"I feel it," said Johnny. "And I think I'm ready for that trip. What's that little poem you made up as a kid? The one you sometimes repeat when you're in a jam?"

Mike nodded his head. "We're not in a jam now, and yet I know what you mean. It sort of affirms my intentions. I do feel jarred loose. It goes like this:

Michael Mars is my name,
America's my nation.
Space-flying is my game
And Mars my destination!"

"It still is, isn't it?" asked Johnny.

"You bet, pal," said Mike. "Let's get back to work. Enough of this mooning."

"Mooning . . .," laughed the Cheyenne. "That *is* the right word, isn't it?"

Below them was the part of the moon which cannot be seen from Earth. The moon rotates on its axis once every twenty-eight days, and in such a way that only one side ever faces the Earth. The far half of

the moon cannot be seen and has never been seen by the human eye. Mike and Johnny and Jack would be the first—and not all of it would be seen by them, for only about a quarter of the surface was in the light of the sun, which was also now nearly setting for them.

This part did not look much different from what had gone before. Again there was a vast plain of gray, rilled and cracked, a typical lunar sea that was much a continuation of what had been on the other side. It seemed much less broken up than the better-mapped side.

“According to the photographs taken by the Soviet robot camera in their Lunik, this side of the moon is a bit less wild than the other side. Seems to have more flat seas and fewer big craters and mountains,” said Mike.

“That would make it sort of like the Pacific Ocean area on Earth—a wide surface without too many islands and land upthrusts,” was Johnny’s comment.

“That’s an interesting idea,” said Mike. “Only if all the water were taken out of the Pacific Ocean, wouldn’t the bottom of it be pretty rugged and jagged?”

“Hard to say,” said the Cheyenne. “The bottom of this sea is cracked, but not very badly.”

They worked the cameras, and their radar swept the surface, recording and registering. “There are lots of tiny craters and spots not known before,” said Mike. “Even on this part. They’ll have a ball naming them.”

“You forget this is a secret flight,” said Jack sitting up, his sleep period over. He had awakened to the conversation. “They will have to keep even the new names secret.”

The other two laughed. Johnny said, “It’s my turn to hit the sack, but if you don’t mind, I’m going to

stay up until we pass into the night area. I think three pairs of eyes are important at this stage.”.

Mike nodded. “We’ll make an exception here. Want to swing that seat back into position, Jack, and we’ll all observe?”

Lannigan worked the central seat back and soon all three sat side by side, watching the new view of the moon.

In another hour they crossed the twilight line, and below them was darkness again. At this point Johnny retired, readjusting the central seat, and then, in darkness, Mike and Jack sat.

This was strange. There were tiny lights on their control board, points of red and green that indicated their functioning spacecraft. Through the windows there was only darkness, for what they looked down on was the surface of an unlit world, night on the unknown side of the moon.

Their faces reflected faintly the lights on the panel and their hands worked quietly as they kept their recording apparatus in action.

A revolving point of greenish light moving around a small disc was the point on which their eyes focused. This was their radar and they could see through it the surface which was invisible to their naked eyes. Flat sea, here and there the light line that indicated a ridge.

A large crater was indicated by the flashing radar light. Mike moved. “Shall we attempt a flash photo?” he asked.

Jack answered, “A good idea. I’ll shoot the flare.”

Within a few seconds a tiny rocket shot from the Apollo, arced down toward the dark surface. The two waited quietly. Minutes passed, then suddenly there was a glare of light as the flare which had ridden the little rocket burst into sudden glow near the surface.

There was a stunning glimpse of great crater walls, sharp and frightening in jagged white light, and for an instant the moonscape below was lit in the eerie flare. Mike flicked the camera fast, grinning tightly.

"Those pictures should be terrific," he whispered, after the flare had fitfully died away. "What a crater that was!" he added.

"Wasn't that the one called Lomonosov?" said Jack. "I think we ought to be over it, judging from the Lunik map."

"Guess so," said Mike. He was clamping the earphones to his head, running again through the radio static from space, an operation he had been repeating at regular intervals throughout their flight.

Once more the roaring of static flooded his ear, the ebb and flow of cosmic noise, the crackling of the electricity between the stars.

He listened, half paying attention, to the meaningless roar, and then suddenly he stopped looking at the radar and was frozen in his seat.

There was a sound, a hum, that was different. He listened and it grew stronger. It was musical, and as it grew stronger, the background static seemed to die away.

The music was strange, unearthly, different. It throbbed and swayed, and beat with instruments that could not be quite like those of any band he had ever seen.

He moved his hands swiftly, checked the directional antenna, brought the music into clarity, and knew it was being recorded as he did so.

Jack nearby was unaware of his excitement, but Mike wondered if the sudden pounding of his heart couldn't be heard somehow by his fellow astronaut. He wanted to ask Jack to listen, but he dared not. He had to keep his secret to himself.

The music was loud and clear and it was not quite



There was a stunning glimpse of great crater walls.

music. Somehow he began to get the idea that it was a sort of language, a message carried in the fashion of musical beats and chords. No true melody, but a message from somewhere to somewhere.

The music grew swiftly, and he brought it down to a refinement in wave length, recorded it, checked its origin. It was coming from somewhere on the dark surface, somewhere on the unseen side of the moon.

What was down there that could be transmitting this? What was sending artificial music from a satellite that nobody believed to be inhabited—that couldn't be inhabited if their knowledge of its airless, waterless, lifeless surface was true?

"Send another flare," he said to Jack. "I'm taking a picture again."

Jack efficiently dispatched a second rocket. This one flared up, and the view once again was spectacular.

"Another huge crater region," said Jack Lannigan, looking at the circle of jagged mountain walls that the brilliant chemical light picked out.

Mike recorded it on the camera. Somewhere down there was the transmitter of unearthly music. He looked down briefly at the area.

"This must be the crater called Joliot-Curie," he said.

And added to himself, and someday we're going to have to come back here, to Joliot-Curie, and walk around on the surface and look for something terribly strange.

The music faded as their capsule, on its swift orbit, left the dark ramparts of Joliot-Curie behind; and by and by there was only the static of outer space.

Johnny awoke now, and as he did so; they saw a new light before them. A crescent appeared beyond a dark edge.

“The Earth is rising again,” said Mike. “We’ve come out from behind the moon. We’re starting our way back home.”

CHAPTER 17

SPACE GUNNER

THERE weren't many observers at the Cape when the second Saturn went off. Not even the usual rubbernecking tourists were there, because it was very early in the morning when the shoot came off. There hadn't been any unusual activity out at the Apollo spur at sunset, and the sudden rush of activity that started about two in the morning hadn't aroused the reporters or observers.

That three more Americans had gone into space was the last thing anyone would have suspected. It was known to the men working out at the grounds, but they were sworn to secrecy on these matters. It was, however, a source of active concern at Central Control.

Holderlin, Van Ness, and Drummond were all there, and they watched the checking out of the Apollo's launching with anxious eyes. It was up, it was moving, it was orbiting.

Hart Williams' voice came through, relayed from a distant station. "Everything in order, sirs," he said. "Check the coordinates of our next jump-off."

Van Ness read through the figures for the junction point. They had been the subject of intense mathematical work the past few hours. It was a rendezvous in space, practically speaking, for they had to get to the point the Russians would have left and be there before Mike's Apollo could arrive.

"You will make your second blast-off in seventeen minutes, Hart," said Van Ness tightly.

"Correct, sir," said the youthful voice from space. "What news from Mike?"

"Mike will be transmitting from the other side in a matter of hours. You should have time. But we still cannot raise him. No radio contact at all, so it all depends on you."

"We can do it," said Hart from the pilot's seat of his Apollo and, reaching forward a gloved hand, he flicked off the transmitter, set the automatics on the figures. Orin and Joe, encased in the same kind of space suits, were grim at their work.

At a point in orbit not too far from the entry point where the Soviet rocket had passed hours earlier, there was a renewed jet of fire in the dark sky a hundred miles up. And a second Apollo system went out of the clutches of Earth's gravity and headed into space.

The transition was not different from Mike's, and the three of Team Copernicus experienced the same sensations that their comrades had experienced.

"Radio contact is faltering," said Orin sharply. "Static is increasing."

Hart frowned. "Must be the same thing that happened to Mike. They rigged up something that may discharge the problem." He reached up to a wire that had been hastily strung in the capsule even while it was being checked out. He connected the ends.

Somewhere there was an electrical discharge. The static in their earphones became violent, unbearable, and then suddenly cleared out, stopped. They could hear Van Ness's voice come back sharp.

"Doctor," said Hart, "the clearing system worked. It was an electrical buildup as you pass through the Van Allen belt. Or a belt we haven't quite charted."

"Good," came Van Ness's voice, now a bit wavery

but audible. "Can you raise Mike directly from outer space?"

Hart tried. He directed his transmitter to the other Apollo, now a couple of hundred thousand or more miles away, but there was no response. It was too far; the moon was too close to Mike.

Hours passed. Reports on the position of the Russian rocket came in regularly from spotting stations around the globe. It was thus and so, it had reached the top of its trajectory, it was reversing.

Hart shook his head when he heard this. "They must have dropped something off out there," he commented.

"Just as we thought," said Orin. "Well, I'm ready."

The burly Marine unstrapped himself from his seat, checked his space suit. He strapped on the tube of a long, pipelike metal apparatus. Joe slid out from his seat, checked his comrade down.

"O.K.?" asked Hart. "We're nearing position."

"O.K." answered both astronauts.

Joe slipped back to the part of the capsule which would have been the top, had they been under gravity's influence. "The good thing about this is that it's got a legitimate air lock," he commented, as he set about unbolting the toggles of the round exit port. "We don't have to exhaust the whole inside."

The port opened, Joe helped Orin slide into the narrow pipelike space, which just fitted him and left him barely enough room to move, like a man jammed into a tight length of empty sewer pipe. "Comfy?" asked Joe, smiling inside his helmet.

"Just dandy," said Orin. "Get this thing closed and pumped out. I crave the wide-open spaces."

"You'll get what you want and more," said Joe, sliding the door shut at Orin's feet and flicking the airpump. As Orin waited, the air was forced out of

the tube. Then, reaching with his hands, he opened the locks of the outer port, shoving it aside.

He looked into space, into an infinity of shining white stars and the whole of the universe, and, trying not to think about it, he forced his way up the tube, slid out the hole, and was on the outside of the Apollo craft.

Magnetic soles kept him on the skin of the capsule and he carefully stood up, fastening a length of nylon rope to a bolt near the open trap door.

Working slowly and with skill born of practice in simulation chambers and below water, he brought the tubelike weapon down from his shoulder, set it up, braced against the bellying skin of the capsule.

As he worked he kept in touch with Hart, explaining what he was doing.

"We are approaching the point of contact," said Hart. "I'll give you a countdown of sixty now."

"Can do," said Orin, looking into the emptiness of space. He could see the moon, he could see the crescent Earth, but he could not see the other spacecraft, nor could he see the tiny objects that he knew must somehow be out there in the void of space.

"Set your angles," said Hart. He gave him the star readings and Orin pointed his tube, braced it.

"Twenty, nineteen, eighteen . . ." was the count.

"I'm set," said the Marine. "All set."

"And it's four, three, two, one, and fire!" said Hart.

Orin pressed the trigger. A jet of fire streamed from the end of the bazooka and rode into space, on its own stream.

As if he had practiced for this, Orin did not hesitate. He freed his feet quickly, slid back down into the open port, thrusting the tube beside him, and in a matter of less than a half minute was inside the spacelock and had the door shut and toggled.



Orin pressed the trigger.

"Forty-one, forty-two, forty-three . . ." he could hear Hart counting inside, and he could hear the air being pumped back into the lock.

With speed, as if they had done this a thousand times, the lock filled with air, and Joe slid open the bottom door and, reaching, took hold of Orin's leg and pulled him back.

He came into the capsule floating, and reached a hand for the back of his seat. Hart was leaning tensely over the radar, still counting. "Sixty, sixty-one, sixty-two——"

The viewplate covering the sector of space where Orin had been suddenly flared brilliant white. Hart snapped it off. Hastily Orin slipped into his seat, Joe already in his, and they both buckled as fast as they could.

The capsule bounced. Something seemed to hit it, not too hard, but it distinctly bounced.

"The atomic bomb went off," said Orin. "That was it."

"And if there was anything in a radius of fifty square miles of that A-bomb you shot out there, it's blasted to shreds now," said Hart.

"Let's get back," said Joe. "We've got our own course to correct for return."

"That's it," said their pilot. They set to work.

Coming back to the Earth, Arkady Kosmodin did not see the atomic blast at the point where they had dropped their mines. He wouldn't have believed it if he had.

CHAPTER 18

THE ROBOT STATION

THE crescent that was Earth rose over the dark edge of Earth's satellite, and seeing it brought smiles to the eyes of the three men in the capsule.

"We've been out farther than anybody else, and we're on our way home, boys," said Mike. "In another few minutes we'll be coming around the other side of the moon, ready to break loose from our moon orbit. Watch the readings."

They continued their routine as before. Now the Earth was in sight, but there was still darkness on the moon below them. They would be approaching the sunrise belt shortly. While they did so, their capsule would be swinging out on its eccentric orbit until it approached the critical point between Earth and moon.

There was still work to be done. Mike was trying to raise Earth without success. Jack was up and Johnny was up and the two were working on the last problem of their flight. They had set up their own estimator and were working on a suborbital chart, like two spacial navigators independent of Mike.

In an hour their efforts bore fruit. There was a new launching. A small robot-operated device fell away from their capsule and, while the three watched, opened its own rocket system, fired away, and fell toward the lunar surface.

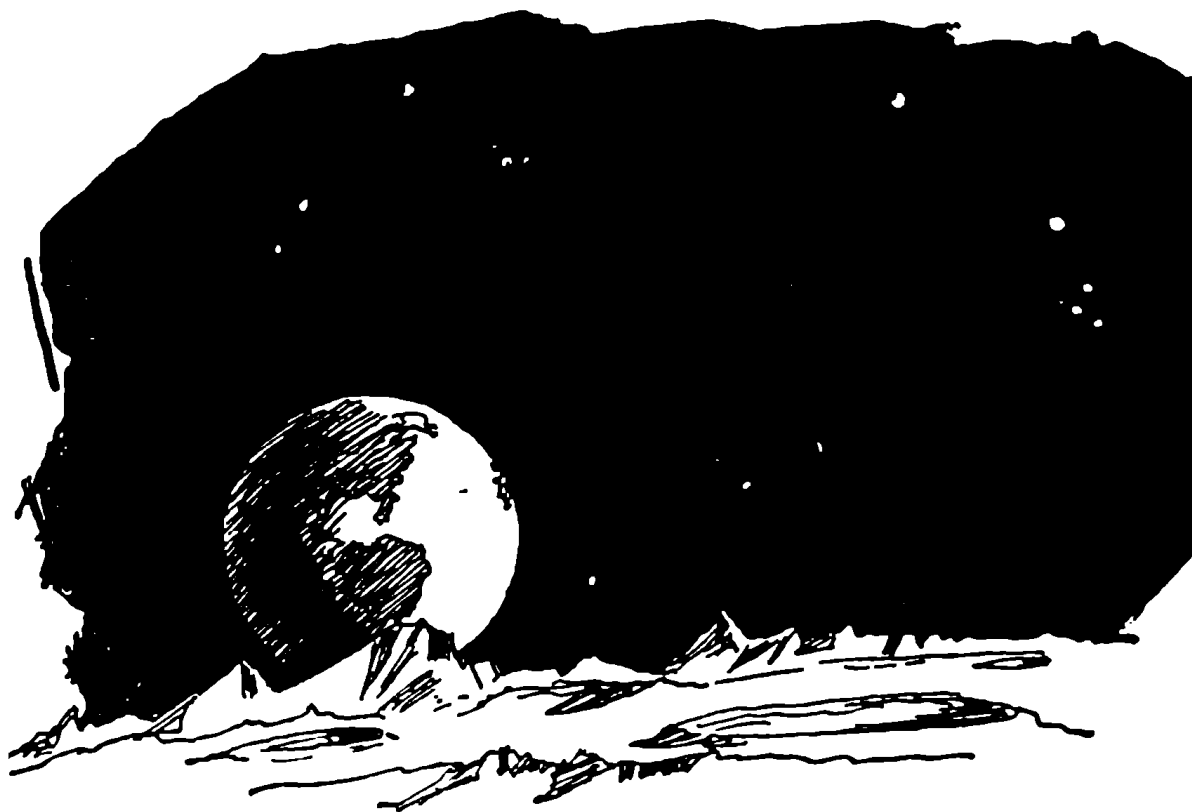
"The automatic transmitter should land on the plain near those craters," said Mike. "That's good."

It will be visible from Earth, and its transmission should go through."

The little station would right itself, stop its fall by automatic rocket shoots, hit the surface, and partially bury itself. A radio antenna would project from the surface, and by means of that it would radiate to Earth the message of the vibrations of the moon's surface and other detection matters it was designed to transmit.

For a time Johnny managed to keep a direct control over its fall, but it was out of sight against the now sunlit moonscape soon enough.

"I imagine it will land all right," said the Cheyenne.



"What with our visual observations and its physical contact, we ought to have enough data to be able to make a manned landing next time."

"And if we're lucky," said Mike, "that'll be our job again."

Mike looked down at the moonscape. "It's going to be a pretty scary operation, though. The more I see of the moon, the grimmer it looks. Makes Antarctica look positively homelike."

Johnny grinned. "And I'll bet you just can't wait to set foot down there."

Mike smiled briefly, but he was thinking of the strange music he had heard on the other side. Some-



body or *something* had been there on the moon before. It wouldn't be just a walk-about expedition. Now it was more important even than that.

He worked his radio, trying to raise Cape Kennedy. He ran over the bands and suddenly he yelped. "I've got something," he said. He listened. The voice was faint, but it gradually became clearer.

"Calling Apollo One," said the voice, and as it spoke, Mike recognized Hart Williams' tones. "This is Apollo Two calling. Please reply."

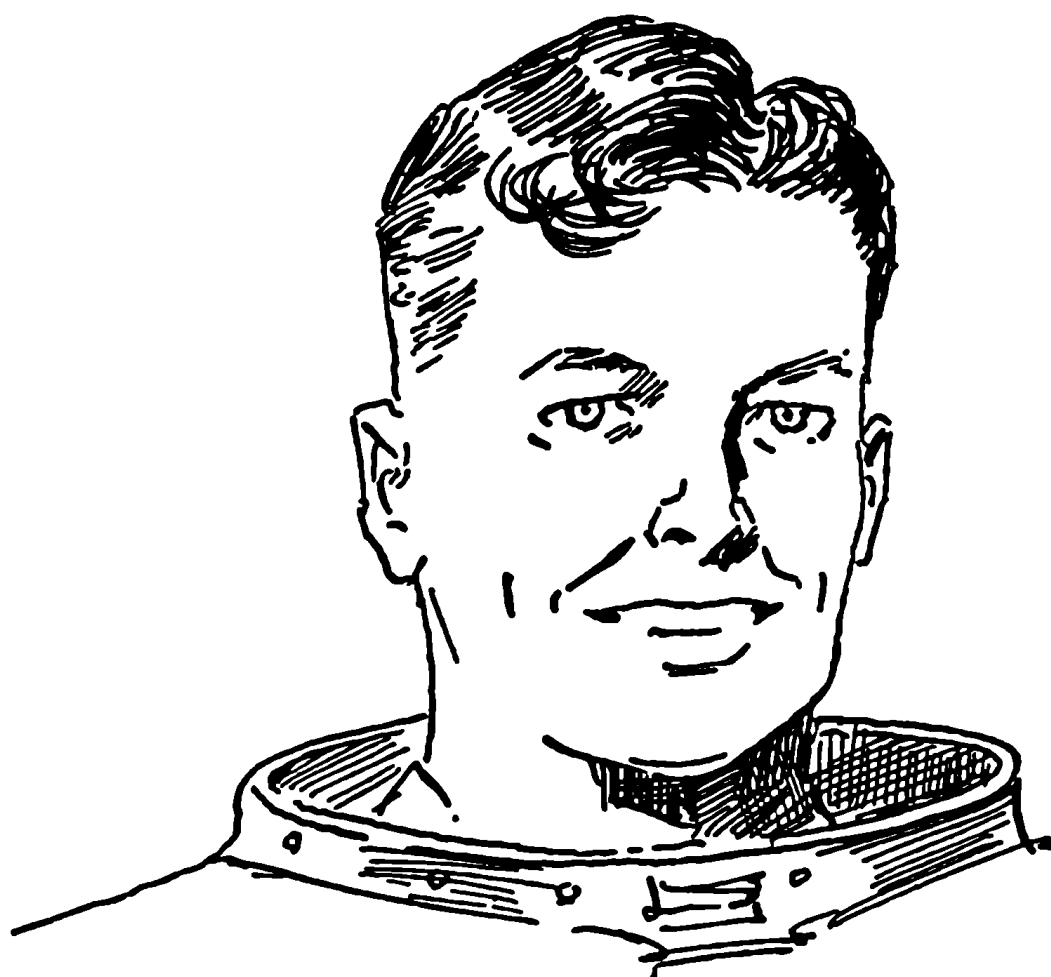
Mike, puzzled, transmitted his reply. The answer flashed back.

By the time Mike and his friends had reached the critical point, they knew that they were not alone in space.

By the time they fired their return rockets, they had guidance. For Apollo Two was in orbit to contact them and speak them down. "You have a new course plotted," said Hart. "There is an area of radioactivity now in your previous path. We are taking you down an alternate."

The flight back to Earth, the re-entry into the atmosphere, the landing are stories in themselves, but they do not add anything to the story of Mike Mars and how he piloted the first spacecraft to go around the moon.

That the teamwork of his friends made it possible for his work to be successful is an old story to the Air Force and to the men of NASA. Space is an enemy that must be conquered by concentration, ability, training, and vigilance. That man may not be alone in space is another problem entirely. There has always been suspicion that there might be other minds out there, other intelligences somewhere among the endless stars. When Mike brought back the evidence, it set a new goal even beyond the necessity of winning the space race.



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